

CHAPTER 19- MEDICATION AND FLYING

1 INTRODUCTION

This chapter outlines the general principles for the use of medications in flying. In other sections of the Manual concerning specific systems, minor differences may be noted from these general principles. In such cases the recommendations concerning specific systems (cardiovascular, neurology, digestive, etc) take precedence.

Any intake of medicine or narcotic substance must be declared in the formal declaration signed by flying personnel and handed to physicians in charge of the evaluation of flying fitness at each medical examination. In principle, pilots taking medication have to be regarded as unfit unless AME / AMC / AMS have been contacted and endorsed resumption of flying duties (see JAR -FCL 3.040 (b), 3.115).

The decision as to whether a pilot is fit to fly under medication has always to be taken in conjunction with knowledge of his clinical situation and the dose and form of prescribed drug.

Consumption of medicines or other substances must always be reported as it may justify temporary or permanent suspension from flying status.

The consumption of such substances may have consequences on qualification for three reasons:

- a the disease requiring a treatment may be cause for disqualification;
- b flight conditions may modify the reactions of the body to a treatment (jet lag, dehydration, moderate hypoxia); and
- c most important, medication may cause adverse side effects impairing flying safety. It should be noted that the effects of medicine do not necessarily immediately disappear when the treatment is stopped, and that the subject may be temporarily disqualified during the withdrawal period.

Flying personnel should nevertheless not be deprived of an efficient treatment because of their professional occupation. What is important is to find the compromise between flying fitness requirements, medical treatment and illness that is the most suitable both for the patient and flying safety.

Flying personnel must be declared fit by their AMS, AMC or AME according to the circumstances and not by their practitioner.

One of the goals of the AME must be to make flying personnel aware of the problems caused by treatments in order to entice them to refrain from taking unreported treatments whose side effects may not have been assessed.

Monotherapy may in certain cases be tolerated for flying personnel but multi therapy which may increase adverse effects requires the greatest supervision.

It is possible that new therapeutic agents will become available that offer significant advantages in treatment. If such agents are considered by the LSST(M) to be appropriate for use by aircrew, with due consideration to aeromedical and safety aspects, their use may be approved. However, as a general rule, medication shall only be endorsed by the AME, if the pilot has taken the respective drug while not on flying duty for an appropriate period of time (temporary disqualification) with proven efficacy and without any side effects, interfering with flying duties.

2 DIGESTIVE PATHOLOGY

2.1 Anti-ulcer medicines (anti acids)

Gastric secretion inhibitors such as H₂ antagonists (e.g. ranitidine, cimetidine) or inhibitors of the proton pump (e.g. omeprazole) may now be acceptable after diagnosis of the pathological condition. After the initial period of treatment which may require temporary disqualification, the risk of a recurrency during the first year, in spite of the scarring observed during endoscopic examination, may justify a treatment with these medicines, which is compatible with flying status.

2.2 Treatment of inflammatory bowel disease

- a Local anti-inflammatory drugs such as mesalazine, a well-tolerated drug, may be compatible with flying status.
- b Rectal corticoids may be acceptable.
- c Salazosulfapyridine should be avoided because of its frequent adverse effects.

2.3 Anti spasmodics

- a Antimuscarinics – dicyclomine, mepenzolate, pipenzolate, poldine and propatheline are used to reduce smooth muscle spasm in non-ulcerative dyspepsia, irritable bowel syndrome and diverticular disease. They all have atropine-like side-effects of confusion, dry mouth, reduced power of accommodation, difficulty with micturition and constipation, which preclude their use.
- b Other antispasmodics – alverine, mebeverine and peppermint oil are acceptable.

2.4 Anti-diarrhoeals

Antimotility drugs such as codeine phosphate, cophenotrope, and morphine are not acceptable.

2.5 Anti haemorrhoids

Soothing preparations containing bismuth subgallate, zinc oxide and haemamelis often mixed with a small dose of corticosteroid may be acceptable in short courses for topical application.

2.6 Treatment of gallstones

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

2.7 Other bowel disorders

In patients suffering from the gastrointestinal colics, the prescription of trimebutine, mebeverine and antacids is compatible with flying status provided that the possibility of an organic disease has been ruled out.

2.8 Kinetosis

Motion sickness drugs are incompatible with flying status since they may interfere with alertness.

3 CARDIOVASCULAR SYSTEM

3.1 Antihypertensive drugs

- a *Beta-blockers*

These drugs may be compatible with flying status if they are prescribed for a condition having no adverse effect on flying safety.

Long-acting Beta-blockers are preferable for flying personnel (e.g. atenolol, metoprolol or bisoprolol), always trying to prescribe the smallest possible efficient dose. Treatment shall be initiated during a period of temporary disqualification. The efficacy of the treatment shall be evaluated (for example by ambulatory arterial pressure measurement during activity) as well as its tolerance by the patient. Excess bradycardia or orthostatic arterial hypotension would be grounds for a change in treatment.

b Diuretics

Whereas loop diuretics are not acceptable, thiazides may be acceptable. Strict laboratory and clinical monitoring is necessary due to the risks of hypokaliemia, and possible metabolic and hydration disorders. Potassium supplements may be required. A combination of thiazide diuretic and spironolactones may also be compatible with flying status.

c Angiotensin Converting enzyme inhibitors

These medications (e.g. captopril, enalapril, lisinipril) may be compatible with flying status. Treatment must be initiated outside of flying periods.

d Angiotensin II Receptor Antagonists

These medications (e.g. Candesartan, Irbesartan, Losartan) may be compatible with flying status. Treatment must be initiated outside of flying periods.

e Calcium-channel blockers

These medications may be also compatible with flying status, they may induce peripheral edemas or headaches, but they are generally well tolerated. Preference shall be given to drugs with the most flexible use (e.g. diltiazem, verapamil, nicardipine or nitrendipine). If used for angina these medications are not compatible with flying status.

f Central antihypertensive drugs (clonidine, alphas-methyl-dopa)

These drugs are unacceptable as they may impair alertness.

g Vasodilating antihypertensive drugs (dihydralazin, prazonin, urapidil)

These drugs are unacceptable because they frequently have adverse side effects such as orthostatic hypotension.

3.2 Antiarrhythmic drugs

Fit assessment of flying personnel with arrhythmias is only possible by AMS after review procedure. Many of these medications have proarrhythmic effects.

| | | | |
|----|-----------|--|----------------|
| a) | Class I | Sodium channel blockers (e.g. flecainide) | not compatible |
| b) | Class II | Beta blockers (e.g. bisoprolol) | compatible |
| c) | Class III | Potassium channel blockers (e.g. Amiodaron, Sotalol) | not compatible |
| d) | Class IV | Calcium channel blockers (e.g. Verapamil) | compatible |
| e) | | Digitalis derivatives | compatible |

3.3 Anticoagulants

Anticoagulants (warfarin, heparin) are strictly incompatible with flying status. But low dose of antiplatelet drugs (aspirin, dipyridamole) may be acceptable.

3.4 Antianginal medications

Nitrates or other antianginal substances (molsidomine and other substances) are incompatible with flying status when used for prevention or treatment of ischemic symptoms.

4 a RESPIRATORY SYSTEM

4.1 Treatment of asthma

Use of oral steroids or theophylline derivatives is incompatible with flying status. Leukotriens may be acceptable.

Respiratory aerosols at small dose may be compatible with flying status :

- a Beta-2-Agonists (e.g. salbutamol in moderate use);
- b anticholinergic drugs (e.g. oxytropium bromide);
- c corticosteroids (e.g. beclomethasone dipropionate); and
- d a regular use of a chromoglicic acid (e.g. cromolyn sodium or nedocromil).

If the treatment fails to restore a satisfactory stable clinical condition, the applicant shall be unfit.

4.2 Antitussive drugs

Antitussive opioids are incompatible as they may induce drowsiness. They are also detected in urine tested for opioid derivatives.

4.3 Antiallergic drugs

Sedating oral antihistaminics are not authorised for flying personnel and incompatible with flying status. Non-sedating oral (e.g. fexofenadine) and topical antihistaminics may be acceptable.

4.4 Expectorants

Mucolytic agents (e.g. carbocysteine) are well tolerated and are compatible with flying status

5 ENDOCRINOLOGY

5.1 Hypothyroidism

Replacement therapy (e.g. levothyroxin sodium) is compatible but requires laboratory monitoring until euthyreoid status is achieved.

5.2 Hyperthyroidism

Treatment of hyperthyreoidism with synthetic antithyroid drugs (e.g. carbimazole or bensylthiouracile), is incompatible with flying status. After treatment - whether radioiodine, surgery

or after antithyroidal medication - pilots may only resume flying duties after euthyroidism is achieved.

5.3 Treatment of gynaecological diseases

Treatments of hormonal gynaecological diseases are compatible with continued flying status

- a normal or mini doses of oestro-progestative drugs;
- b progestatives, either natural progesterone or synthetic derivatives.

6 METABOLIC DISEASES

6.1 Diabetes

Insulin dependent diabetes is a contra-indication to flying. Only insulin independent diabetes and diabetes not requiring insulin administration and non complicated remains compatible with flying status. Hypoglycaemic sulfonamids and insulin treatment are disqualifying for all types of flying activities. Biguanides associated with appropriate monitoring and diet remain the only possible treatment.

6.2 Dyslipidaemia

Dyslipidaemia in flying personnel should be treated in conjunction with an appropriate diet and weight reduction if appropriate. A treatment with drugs that lower concentrations of plasma lipoproteins should be prescribed if this diet is not fully effective, and only in this case.

- a HMG-CoA reductase inhibitors with preference for hydrophilic molecules such as pravastatine rather than lipophilic substances such as simvastatin which may induce sleep disorders.
- b Treatment with fibric acids (e.g. fenofibrate or gemfibrozil) should be discontinued in the case of gastrointestinal side effects or elevated transaminase concentration (greater than 3 times the normal concentration).
- c Cholestyramine, after a previous evaluation of gastrointestinal tolerance (frequent constipation).

6.3 Hyperuricemia

Acute gout is incompatible flying status.

Hypouricemic substances (e.g. allopurinol) may be acceptable. Flying personnel should be disqualified during the initial period of therapy.

7 NEUROLOGY

7.1 Treatment of epilepsy and Parkinson's disease

Drugs prescribed for the treatment of epilepsy and Parkinson's disease are incompatible with flying status.

A withdrawal period of approximately two months must be allowed if the anti-comital treatment is discontinued prior to a new electroencephalographic evaluation.

7.2 Migraine treatment

No anti-migraine treatment is allowable.

Only derivatives of ergot used in single-drug therapy after a previous test period and vascular evaluation may be compatible with flying status.

7.3 **Drugs for the autonomic system**

These drugs are far less commonly prescribed than in earlier times. This is true for parasympathomimetic drugs, sympathicomimetic drugs such as adrenaline or parasympatholytic drugs such as atropine derivatives. When prescribed for systemic use or local applications (collyrium) all these drugs must be considered as incompatible with flying status.

7.4 **Nicotine products**

Nicotine products used for smoking cessation may be allowed.

8 PSYCHIATRY

All drugs used for psychiatric treatment may affect alertness and upper brain functions: therefore they are incompatible with flying status. These drugs include barbiturates, neuroleptic antidepressant, normothymic, anxiolytic and hypnotic drugs.

The problem is to preserve the quality of sleep during stop-overs in long-haul flights, and for this purpose the ingestion of very short half-life hypnotics (e.g. zolpidem, zopiclone) appears as an elegant remedy. However, as medical monitoring is not guaranteed and sufficient time lapse between intake and subsequent flight duties cannot be guaranteed, use of any hypnotics and melatonin should be discouraged by AMEs. Non-medical remedies (e.g. no caffeine, alcohol, smoking or exercise prior to bed-time, silence, darkness, fresh air and lower temperature in bedroom, relaxation techniques) should be recommended.

The use of narcotics is strictly forbidden. In the anglo-saxon meaning of the word, the term 'narcotics' covers heroin, morphine, cocaine, cannabis, but also amphetamines and other stimulants.

9 ANALGESIC AND ANTI-INFLAMMATORY DRUGS

9.1 **Analgesics**

Analgesics containing morphine or not (nefopam) which act upon the central nervous system are strictly incompatible with flying status.

The most commonly prescribed peripheral analgesics remain compatible with flying status depending on the reason why they have been prescribed, and if they are administered at moderate doses. These are paracetamol, aspirin, and derivatives of propionic acid.

A frequently encountered problem is that of the combination of these substances with sympathicomimetic drugs and antihistamines for nasal decongestion purposes. Such a prescription is *a priori* disqualifying.

9.2 **Anti-inflammatories**

a *Non steroid anti-inflammatories*

These substances prescribed for a short treatment at moderate doses may be compatible with flying status if there is no contra-indication (gastro-duodenal ulcer, hypersensitivity), and if the condition which justifies their prescription is itself compatible with flying status.

b *Steroid anti-inflammatories*

These substances are incompatible with flying status.

10 TREATMENT OF INFECTIONS

10.1 Antibiotics

Considering the reasons why antibiotics are prescribed they are usually not compatible with flying status.

Anti-tuberculosis treatments are incompatible with flying status.

10.2 Antiviral treatment

AZT (azidothymidine) or DDI (Videx) are incompatible with flying status.

Interferon treatment is also incompatible with flying status.

10.3 Vaccinations

Flying personnel are liable to currently mandatory vaccinations recommended by domestic and international sanitary regulations. Furthermore anti-A and -B hepatitis, anti-typhoid and anti-meningitis vaccination must be highly recommended.

There is no contra-indication against vaccination for flying personnel except in cases of immunodeficiency, and vaccination must be strongly recommended. It induces no flying restriction. However, pilots should not fly within 24 hours after receiving a vaccination.

For more information on vaccinations please refer to the Subchapter 4 Vaccinations in Chapter 18- Tropical Medicine.

10.4 Chemoprophylaxis (anti-malarials)

Anti-malarial drugs used for the treatment of malaria are incompatible with flying status.

Basis of malaria prophylaxis is exposure prophylaxis, consisting of prevention against mosquito bites (repellents, nets, insecticides).

Additional Chemoprophylaxis: Long-term antimalarial chemoprophylaxis, warranted due to frequent visits to endemic areas, used to be a problem for aviators. The only approved drug for airmen used to be Chloroquine and Proguanil. As the efficacy of that combination is only about 50- 60 % for the time being, a more effective regime should be chosen. Mefloquine and Atovaquone/Proguanil have an efficacy of about 90 %. Nevertheless, Mefloquine is not compatible with flying duties. Atovaquone/Proguanil (Malarone®) is malaria prophylactic of choice for airmen as the medication has to be started only 1 day before entering and to be continued 7 days after leaving the risk area.

For more information about malaria please refer to the Subchapter 5 Malaria in Chapter 18 - Tropical Medicine.

11 DERMATOLOGY

11.1 Keratolytic treatments

Such treatments frequently used by flying personnel suffering from psoriasis are incompatible with flying status.

Systemic treatment with these agents (etretinate) may cause serious drying of the skin and mucosa and particularly of the conjunctival tissues, intensified by flying conditions and resulting in significant dark vision disorders.

11.2 **Dermatological topical treatments**

These are acceptable except for chronic applications of class I and II topical dermocorticoids.

11.3 **Acne**

Antiseptics, keratolytics, topical retinoids and topical antibiotics are acceptable.

Systemic antibiotics or a cyproterone acetate ethinyloestradiol combination is also acceptable.

Isotretinoin is not acceptable because of side-effects.

11.4 **Exczema**

A topical emolient, soap substitutes, keratolytics, coal tar, paste (with zinc or ichthamol) and tar shampoos are acceptable. Treatments for weeping exczema are generally contra-indicated because underlying disorder. Systemic gamolenic acid is acceptable.

11.5 **Pruritus**

Systemic treatment of pruritus with oral anti-histamine drugs is unacceptable.

12 **EAR-NOSE-THROAT**

Local ENT treatments may be compatible with flying status if the affection which requires this treatment is also compatible with flying status. Their use shall be limited in time in order to avoid iatrogenic complications, particularly for nasal decongesting agents.

12.1 **ENT drugs**

Nasal decongestants with no effect on alertness (e.g. clobutinol or oxeladine) are compatible.

Mucolytic agents (e.g. carbocysteine) are well tolerated and are compatible with flying status.

12.2 **Antiallergic drugs**

Sedating oral antihistaminics are not authorised for flying personnel and incompatible with flying status. Non-sedating oral (e.g. fexofenadine) and topical antihistaminics may be acceptable.

13 **OPHTHALMOLOGY**

Local anti-infection and non cortisonic anti-allergic collyria are compatible with flying status. Anti-glaucoma collyria containing beta-blockers are also compatible with flying status, but anti-glaucoma collyria modifying the diameter of the pupils, and mydriatic, myotic, and cytoplegic collyria are incompatible with flying status.

Pilots who wear contact lenses while flying should never use any preparation while wearing the lenses.

Table: MEDICATION AND FLYING

| | Generic International Name | | Remarks |
|--|----------------------------|--------------------------------------|---|
| | compatible | incompatible | |
| 1 Digestive Pathology | | | |
| Anti-ulcer medicines | RANITIDINE | | |
| | CIMETIDINE | | |
| | OMEPRAZOL | | |
| Treatment of inflammatory colitis | MESALAZINE | SALAZOSULFAPYRIDINE | Minimal medication such as sulphasalazine or local medication like steroid or sulphasalazine enema or suppository may be acceptable |
| Anti-spasmodics | | DICYCLOMINE | |
| | | MEPENZOLATE | |
| | | PIPENZOLATE | |
| | | POLDINE | |
| | | PROPATHELINE | |
| | | ALVERINE MEBEVERINE | |
| Anti-diarrhoeals | LOPERAMIDE | CODEINE PHOSPHATE | |
| | | COPHENOTROPE | |
| | | LOPERAMIDE | |
| Anti-haemorrhoids | | | Local medication like steroid or sulphasalazine enema or suppository may be acceptable |
| Treatment of Gallstone | TRIMEBUTINE | | |
| | MEBEVERINE | | |
| Kinetosis, motion sickness | | | not acceptable |
| 2 Cardiovascular System | | | |
| 2.1 Anti-hypertensive drugs | | | |
| Beta blockers | ATENOLOL | | |
| | METOPROLOL | | |
| | BISOPROLOL | | |
| Angiotensin converting enzyme inhibitors | CAPTOPRIL | | |

| | | | |
|-------------------------------------|-----------------------|------------|--|
| | ENALAPRIL | | |
| | LISINOPRIL | | |
| Angiotensin II Receptor Antagonists | CANDESARTAN | | |
| | EPROSARTAN | | |
| | IRBESARTAN | | |
| | LOSARTAN | | |
| | TELMISARTAN | | |
| | VALSARTAN | | |
| Diuretics | THIAZIDICS | | |
| | SPIRONOLACTONE | | |
| | | FUROSEMIDE | |
| Calcium channel blockers | DILTIAZEM | | |
| | VERAPAMIL | | |
| | NICARDIPINE | | |
| | NITRENDIPINE | | |

| | <i>Generic International Name</i> | | <i>Remarks</i> |
|---|---|---|--|
| | <i>compatible</i> | <i>incompatible</i> | |
| Central anti-hypertensive drugs | | CLONIDINE | |
| | | ALPHAMETHYL-DOPA | |
| Vasodilating anti-hypertensive drugs | | DIHYDRALAZINE | |
| | | PRAZOZINE | |
| | | URADIPIL | |
| 2.2 Anti-arrhythmic drugs | | | |
| Vaughan Williams Class I | | CHINIDIN, DISOPYRAMID, AJMALIN, LIDOCAIN, PHENYTOIN, PROPAFON, FLECAINID, MEXITILLINE | |
| Vaughan Williams Class II, BETABLOCKERS | ATENOLOL, METOPROLOL, BISOPROLOL | | |
| Vaughan Williams Class III | SOTALOL | AMIODARON | |
| Vaughan Williams Class IV | VERAPAMIL | | |
| Other anti arrhythmic drugs | DIGITALICS | | |
| 2.3 Anticoagulants | | | |
| | | HEPARINE | After deep vein thrombosis a subcutaneous injection of low molecular heparin may be acceptable prior to a long distance flight |
| | | RHENINDIONE | |
| | | ACENO COUMAROL | |
| | | WARFARINE | |
| | ASPIRIN | | |
| | DIPYRIDAMOL | | |
| 2.3 Antianginal medication | | | |
| | | NITRATES | |
| | | MOLSIDOMINE | |

| 3 Respiratory system | | | |
|------------------------------|----------------------|-------------|-------------------|
| Treatment of asthma | | | |
| Theophylline derivatives | | THEOPHYLLIN | |
| Respiratory aerosols | SALBUTAMOL | | |
| | OXYTROPIDIUM BROMIDE | | |
| | BECLMETHASONE | | |
| | CROMOGLYCIN SODIUM | | |
| Decongestive drugs | CLOBUTINOL | | |
| | OXELADINE | | |
| Mucolytic agents | BROMHEXIDINE | | |
| | ACETYLCYSTEINE | | |
| | CARBOCISTEINE | | |
| Sedating antihistaminics | | | not acceptable |
| Non-sedating antihistaminics | | | may be acceptable |

| | <i>Generic International Name</i> | | <i>Remarks</i> |
|--|-----------------------------------|---------------------|----------------|
| | <i>compatible</i> | <i>incompatible</i> | |
| 4 Endocrinology | | | |
| Hypothyroidism | LEVOTHYROXINE SODIUM | | |
| Hyperthyroidism, Anti-thyroid drugs | | CARBIMAZOLE | |
| | | BENZYL THIOURACILE | |
| Hormonal treatments of gynecological diseases | | | |
| Progestative | MEDROXYPROGESTERONE | | |
| | LYNESTRENOL | | |
| | LEVONORGESTREL | | |
| | NORETHISTERONE | | |
| | NORGESTRIEONE | | |
| 5 Metabolic diseases | | | |
| Dyslipidemia | PRAVASTATINE | | |
| | | SIMVASTATINE | |
| | CHOLESTYRAMINE | | |
| | FENOFIBRATE | | |
| | GEMFIBROZIL | | |
| Hyperuricemia | ALLOPURINOL | | |
| | | COLCHICINE | |
| 6 Neurology | | | |
| 7 Psychiatry | | | |
| Sleep disorders | | ZOLDIPEM | |
| | | ZOPICONE | |
| | | MELATONINE | |
| 8 Analgesic and anti-inflammatory drugs | | | |
| Central analgesics and narcotics morphinics | | MORPHINE | |
| | | CODEINE | |
| | | CODETHYLIN | |

| | | | |
|-------------------------------|----------------------------------|----------|------------------|
| | | HEROÏNE | |
| | | COCAÏNE | |
| | | CANNABIS | |
| Peripheric analgesic | PARACETAMOL | | |
| | ACETYL SALICYLIC ACID | | |
| | DERIVED OF PROPIONIC ACID | | |
| Steroid anti-Inflammatories | | | all incompatible |
| Non steroid anti-inflammatory | DICLOFENAC | | |
| | | | |

| | Generic International Name | | Remarks |
|-----------------------------------|-------------------------------|-----------------|---|
| | compatible | incompatible | |
| 9 Treatment of infections | | | |
| Antibiotics | | | |
| Macrolides | | JOSAMYCINE | |
| Beta-lactamines | | PENICILLINE | |
| Phenicoles | | CHLORAMPHENICOL | |
| Antiviral treatment | | AZIDOTHIAMINE | |
| | | DDI | |
| | | INTERFERON | |
| Vaccinations | | | all compatible, minimum period of 24 h before next flight |
| Chemoprophylaxes | | | |
| Antimalarials | CHLOROQUINE | | |
| | PROGUANIL | | |
| | | MEFLOQUINE | |
| | ATOVAQUONE / PROGUANIL | | |
| 10 Dermatology | | | |
| Keratolytic treatments | | ETRETINATE | |
| Dermatological topical treatments | | ISOTRETINOID | |
| | CYPROTERONE ACETATE | | |
| | GAMOL ENIC ACID | | |