
Australasian Fire Authorities Council (AFAC)

Medical Guidelines for Firefighters



Summary Document

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AFAC Medical Guidelines for Firefighters: Summary Document

Prepared by
The Health and Fitness Working Group
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The following document is a general guideline for the information of doctors conducting health assessments for firefighters and associated emergency service workers in all states of Australia and New Zealand. Whilst the information provided in this document reflects national and international medical standards, individual agencies will adopt a risk management approach taking into consideration the circumstances of each firefighter and each agency on a case-by-case basis. Guidelines presented in this document are reviewed on a regular basis and will change with appropriate supporting medical evidence.

FORWARD

In 1999 the Australasian Fire Authorities Council undertook to develop guidelines relating to the health and fitness of professional and volunteer firefighters. An initial workshop was held in 2000, and the first edition of the Medical Guidelines for firefighters was published in 2002. The valuable work of Dr Barry Gilbert of Public Health Pty Ltd is gratefully acknowledged for this document.

A second workshop was held in February 2006. The present guidelines reflect the consensus view of five fire service physicians who attended the meeting (Victoria, NSW, South Australia and New Zealand). For many of the sections, advice from “expert” medical specialists and medical colleges was also sought. All sections have been revised, with major revisions to the vision and cardiac sections. Additional revisions are in progress for the neurology and respiratory sections.

The present document is more concise than the 2002 Guidelines. It is based on the 2005 NSW Fire Brigades summary which also took into account related NFPA (USA), Canadian and UK guidelines. The 2005 summary, and the present revision has been written by Dr Maryanne Dawson and edited by Mr Brian Woods of the NSW Fire Brigades. Their valuable contribution is gratefully acknowledged.

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INTRODUCTION

Firefighters perform functions that are physically and psychologically very demanding. These functions are often performed under difficult environmental conditions. In emergency situations, it is not always possible to perform tasks in an “ergonomic” fashion. Essential firefighting tasks are often performed at near maximal physical work capacity for prolonged periods of time. The firefighter’s heart rate and blood pressure may escalate from resting level to near maximum in a matter of seconds. External factors such as heavy protective equipment and heat from a fire contribute to the physical load. Internal factors such as the body’s adrenergic response and physiological contribute metabolically. External and internal factors combine to produce very high working blood pressures, heart rates and core temperatures. Exposure to smoke, carbon monoxide and toxic gases increases the risk for cardio-respiratory stresses among firefighters.

Firefighters may have to work at heights, climb, crawl, lift, carry, push or pull heavy loads. They encounter tasks that require the strength, skill or speed of many other occupations with the added stresses of the emergency nature of the task.

Firefighters and other emergency personnel are potentially exposed to hazardous substances (physical, chemical and biological) during their work. Whilst the use of breathing apparatus helps to reduce exposures in urban firefighting, mechanical, environmental and behavioural factors can limit their use. Breathing apparatus and PPE weighing around 20kg and increase the respiratory effort by about 20%. There is a trade off between protection against a chemical hazard and creation of an impractical mechanical load.

PURPOSE OF THE GUIDELINES

These guidelines have been developed with the primary focus being injury and illness prevention for firefighters in all AFAC agencies. The assessment and reporting process have been designed to meet the duty of care for firefighting agencies, whilst also protecting the confidentiality of the individual. The guidelines should assist agencies to ensure that firefighters and associated emergency personnel can meet the essential tasks of their work without significantly increasing the risk of illness or injury. It should be noted that the guidelines do not purport to cover other occupations. They are designed for fire agency personnel providing firefighting and rescue functions.

RELATED LEGISLATION

This document is intended to complement the various Australian state, territory and New Zealand laws and regulations such as those for occupational health and safety, workcover, human resources management and specific standards for use of contained air breathing apparatus, work in confined spaces and dealing with hazardous substances.

UNDERLYING PRINCIPLES

1. The guidelines will be supported wherever possible by evidence based medical research or accepted best medical practice.
2. The guidelines will undergo regular review.
3. Whilst workplace safety is the priority, the guidelines must also remain practicable.
4. Individual agencies should have the freedom to use the guidelines as they stand, or to make adjustments to meet the special needs of that agency, provided this is done in accordance with the first two principles.
5. Agencies will use their own consultative processes for local implementation.
6. The application of the guidelines is to be non-punitive.
7. The methodology in health and fitness monitoring will be underpinned by a risk management approach.

THE HEALTH ASSESSMENT PROCESS

Health assessments are to be conducted by a medical practitioner registered in a state or territory of Australian, or New Zealand. Where practicable, the medical assessment process should be conducted by, or under the supervision of a fire service physician¹.

The guidelines are written for doctors, but their specific application in individual cases may require more detailed knowledge of firefighting. The guidelines are therefore best interpreted with knowledge of both medicine *and* firefighting. The occupational context is very important. Application of the guidelines in a simple administrative fashion may result in the unfair under classification, or unsafe over classification of an individual.

The health assessment process must include a full medical assessment at the entry level (the pre-employment health assessment). The health and fitness working group strongly encourages agencies to develop ongoing programs for periodic

¹ A fire service physician is a registered medical practitioner employed by, or consultant to a fire service or related agency, who has the specific responsibility of advising on health and fitness matters for that agency.

health assessment of firefighters. How often this should be done, and whether periodic health assessment should be voluntary or compulsory is a matter for individual agencies. Each agency must ensure that they comply with their relevant legislative requirements.

THE MEDICAL EXAMINATION

The examination is conducted according to an agency-determined protocol, with the components determined by the agency as a result of a medical risk assessment. The following is recommended as a minimum:

- health questionnaire of past and current medical history
- occupational history
- physical examination including
 - anthropometry – height, weight, measures of obesity
 - vision testing – near, distance, colour, binocular
 - face, head and neck, especially for BA fit
 - cardiovascular system
 - respiratory system
 - musculoskeletal system
 - neurological system
 - general examination of abdomen and skin
- special tests – including baseline measures
 - urinalysis as screening test for diabetes, renal function
 - blood tests as required for HAZMAT exposures- FBC, UEC, LFT
 - spirometry
 - hearing/ audiometry as required for noise exposure
 - chest x-ray if indicated for asbestos exposure
 - post vaccination serology e.g. for hep B, hep A
- optional tests for preventive health
 - lipid studies including HDL, LDL and triglycerides
 - blood glucose

Sample forms have been included in the appendix.

MEDICAL CATEGORIES (classification of medical conditions)

The following sections outline those medical conditions that have been identified as being of significance for firefighters. The identified medical conditions have been categorised as follows:

- Category A** Category A conditions relate to circumstances that are not safely compatible with firefighting. Reasons for inclusion of medical conditions in Category A include a heightened risk of a serious adverse event or significant likelihood that a pre-existing condition will be made worse when the affected person performs the essential tasks of firefighting. Applicants should be aware that the presence of a Category A condition will usually preclude a person from firefighting duties unless there is specialist medical advice based on sound medical evidence to the contrary.
- Category B** Category B conditions indicates that a more detailed medical assessment is required. Usually, this must be conducted by an appropriately qualified specialist. The presence of a category B condition will commonly preclude firefighting, unless specified conditions are met.

MEDICAL CLASSIFICATION (classification of the individual)

Following the medical examination, the individual is classified in the following way :

- Class 1:** Fit for the nominated role without restriction
Class 2: Fit for most of the tasks of the role, but some restriction is required
Class 3: More information is required. The assessing doctor will advise what level of duty may be performed during this interim stage.
Class 4 Unfit for the nominated role.

Class 1 Implies that there are no restrictions for the intended function and also implies fitness for any test of cardiorespiratory fitness.

Class 2 is similar to class 1, but there is some condition about which the employer needs to be aware to meet the duty of care, for example a simple musculoskeletal injury or reduced cardiorespiratory fitness. Medical supervision may be required for a cardiorespiratory fitness test.

Class 3 is a 'holding' classification where further information is required before a final classification can be made. This class may not preclude full duty or a participation in a cardiorespiratory fitness test, depending on the reason for the temporary unfit classification.

Class 4 means that the results are inconsistent with a person meeting the medical requirements of the intended role, and that performance of a cardiorespiratory fitness test is not advisable.

FITNESS MONITORING AND FITNESS CLASSIFICATION

Medical classification should be completed prior to the conduct of a cardiorespiratory fitness test. Testing should be conducted in accordance with the American College of Sports Medicine protocols. Further details about this are covered in the AFAC fitness guidelines. How often this should be done, what test is used and whether fitness testing should be voluntary or compulsory is a matter for individual agencies. Each agency must ensure that the test matches their essential tasks and physiological demands of work.

RECOMMENDED VACCINATIONS

Vaccination should be in accordance with the current Australian NH&MRC vaccination schedule (or relevant New Zealand equivalent). Hepatitis B vaccine is considered mandatory for emergency workers due to occupation exposure to blood and body fluids in rescue situations. Hepatitis A vaccine is recommended for workers who may be exposed to sewage such as in rescue situations. Tetanus vaccination is also required, but individuals who have had the full primary vaccination in childhood and two boosters do not usually require additional boosters until age 55 years. Workers within the essential services category should consider having an influenza vaccine each year. Whether or not this is provided for by the agency should be a local matter.

The recommended vaccinations for all agencies are:

- full primary childhood vaccination including two boosters for tetanus
- hepatitis B vaccination
- hepatitis A vaccination – for rescue and HAZMAT, or post exposure
- Influenza vaccination

MEDICAL CONDITIONS AND FIREFIGHTING

VISION AND EYE DISORDERS

Category A

- Best corrected distance vision less than 6/9 binocular (with two eyes)
- Best corrected distance vision less than 6/18 in either eye
- Best uncorrected distance vision less than 6/36 binocular (with both eyes)
- Best corrected near vision less than N5 (with both eyes)
- Visual fields less than 120 degrees in the horizontal field in each eye or less than 140 degrees if there is other visual field loss
- Any form of protan colour vision impairment
- Significant deutan colour vision impairment (other than mild forms)
- Retinal detachment
- Diplopia
- Night blindness
- Severe corneal scarring, resulting in impaired vision, even though the person may pass the above criteria
- Monocular vision

Category B

- Mild deutan colour vision impairment (subject to passing the Fire Brigades Colour Vision Test)
- Cataracts
- Any other eye disease that is likely to be progressive or recurring, such as diabetic retinopathy, retinitis pigmentosa, optic neuritis
- Iritis
- Glaucoma
- Refractive surgery

EARS AND HEARING

Category A

- Severe uncorrectable binaural hearing loss
- Any condition that may result in the sudden onset of vertigo

Category B

- Severe uncorrectable unilateral hearing loss
- Meniere's disease
- Severe tinnitus
- Vertigo
- Otosclerosis

CARDIAC CONDITIONS

Category A

- Proven angina or suspected angina when the cause of chest pain is in doubt
- Heart failure of any degree or cause
- Cardiomyopathy of any degree or cause
- Heart valve defect that is either symptomatic or associated with significantly increased risk of an adverse cardiac event
- Cardiac arrhythmia, unless stable or well controlled on medication or proven not to cause haemodynamic symptoms when present
- Recurrent syncope
- Any other cardiovascular condition resulting in the person being unable to safely meet the aerobic fitness requirements for the position

Category B

- Acute or chronic pericarditis, endocarditis or myocarditis
- Presence of a pacemaker
- Presence of an implantable defibrillator
- The person is taking anti-coagulants, particularly warfarin
- Presently asymptomatic heart valve lesions
- History of coronary artery disease including myocardial infarction, coronary bypass surgery, coronary angioplasty
- Atrial tachycardia, flutter or fibrillation
- ECG abnormality that suggests ischaemic heart disease such as left bundle branch block, 2nd or 3rd degree A-V block or right bundle branch block
- Ventricular tachycardia
- Bradycardia resulting in syncope
- Recurrent paroxysmal tachycardia
- Prior history of a congenital cardiac anomalies
- Presence of metabolic syndrome

VASCULAR CONDITIONS

Category A

- Persistent severe hypertension not responding to treatment and/ or
- Hypertension with evidence of end organ damage (cerebral, retinal or renal)
- Taking medication that results in postural hypotension or drowsiness
- Presence of an aortic or cerebral aneurysm until treated
- Any other cardiovascular condition that results in a person being unable to safely meet the VO₂max requirements for the position

Category B

- Stroke due to haemorrhage
- Transient ischaemic attack
- Stroke due to ischaemia
- Prior history of treated aortic or cerebral aneurysm
- Taking anticoagulant medication
- Clinical evidence of peripheral vascular disease
- Recurrent deep vein thrombosis
- Any significant abnormality of the aorta, carotid arteries or other large blood vessel
- BP > 150/95 that is persistent and not responding to treatment.

LUNG AND RESPIRATORY CONDITIONS

Category A

- Present or recurrent pneumothorax
- Severe asthma or asthma with demonstrated bronchial hyper-reactivity, prior diagnosis of occupational asthma including RADS, RAIDS
- Active TB
- Any other respiratory condition that results in a person being unable to safely meet the respiratory requirements for the position

Category B

- Other types of asthma or obstructive lung disease , such as exercise induced asthma
- Conditions with functional lung volumes of 20% or more below the predicted value
- Restrictive lung disease
- Chest wall deformity
- Previous lung surgery
- Prior history of tracheostomy
- Lung cancer
- Bronchiectasis
- Sleep apnoea

MUSCULOSKELETAL CONDITIONS

Category A

- Total knee or total hip replacement
- Significant hip, knee or ankle degenerative arthritis with extensive loss of articular cartilage
- Any inflammatory arthropathy with radiological evidence of abnormality
- Hip knee or ankle injury with significant loss of range of movement
- Spinal fracture associated with spinal segment instability and increased risk of spinal cord compression or other nerve damage
- Prior history of significant head injury with cognitive impairment or seizure
- Any other condition that results in a person not being able to meet strength, mobility and functional requirements for the position

Category B

- History of back condition requiring discectomy, laminectomy or spinal fusion
- Hip resurfacing procedures such as the Birmingham hip.
- Any condition with significant loss of articular cartilage, including total meniscectomy of the knee
- Any condition that has required surgical treatment such as ACL reconstruction of the knee
- Any condition that has resulted in a significant functional impairment at the hip, knee or ankle
- Amputation or deformity of a joint or limb
- Recurrent dislocation of the shoulder
- Significant rotator cuff tear of the shoulder
- Any other condition that has resulted in a significant functional impairment at the shoulder
- Any condition that has required surgical treatment such as acromioplasty of the shoulder
- Recurrent or tendonitis of the shoulder, elbow, wrist or hand
- Carpal tunnel syndrome
- Fracture or dislocation of any bone or joint
- Osteomyelitis or arthritis affecting any joint in the spine
- Ankylosing spondylitis and related inflammatory arthropathies
- Any other spinal fracture
- Any condition requiring surgery of the cervical spine
- Skull, jaw or facial conditions that may affect the ability to wear a helmet or breathing apparatus
- Thoracic outlet syndrome
- Any other condition that results in a person not being able to meet strength, mobility and functional requirements for the position

NEUROLOGICAL

Category A

- *Epilepsy where a definitive diagnosis has been made based on clinical findings or medical tests and:
 - (a) The person remains on medication; or
 - (b) The person has been off medication and seizure free, but where the seizure free duration has been less than five years
- Multiple sclerosis with evidence of progression
- Muscular dystrophy
- Any significant or progressive neurological condition affecting cognitive function, balance or neuromuscular function
- Parkinson's disease
- Dementia of any type
- Narcolepsy
- Brain injury of any type affecting cognitive function, balance or neuromuscular function
- Intellectual impairment of any type resulting in inability to perform cognitive tasks as may be required in training, or in the performance of firefighter activities
- Any other condition that may result in a sudden change in consciousness or ability to perform motor tasks
- Any other condition that results in a person not being able to meet strength, mobility and functional requirements for the position

Category B

- *A single seizure for which the cause is unclear but is highly unlikely to recur, or a single seizure, due to a clearly identifiable, non-recurring cause that is highly unlikely to recur
- *Epilepsy where the person has been seizure free for more than five years whilst off medication, AND where the risk of seizure is not increased when performing the essential tasks of firefighting
- Stroke (see vascular conditions)
- Clinical pain syndrome
- Peripheral sensory or motor neuropathy
- Peripheral nerve injury
- Spinal cord injury such as radiculopathy/nerve root compression due to disc prolapse
- Any significant head injury or concussion
- Brain tumour
- Congenital neurological malformations

** Note – the medical guidelines for epilepsy and seizures are currently under review with the Australasian Society of Neurologists*

ABDOMINAL AND GENITOURINARY CONDITIONS

Category A

- Malignant tumours of the bowel, GI tract, kidney, prostate or other part of the genitourinary tract. Cancers may be classified as Category B following successful treatment
- Pregnancy for its duration, and until 6 weeks post partum
- Any condition resulting in incontinence of bowel or bladder
- Any other condition that results in a person not being able to meet strength, mobility and functional requirements for the position

Category B

- Hernia
- Acute infectious hepatitis
- Hepatitis (with abnormal liver enzymes) due to non-infectious causes
- Pancreatitis
- Inflammatory bowel disease
- Acute GI bleeding from any cause
- Malignant tumours following treatment
- Menorrhagia
- Loss of kidney or other abdominal organ.
- Other levels of renal failure, either acute or chronic

BLOOD CONDITIONS AND INFECTIOUS DISEASES

Category A

- All malignancies of blood and lymphatic systems – including leukaemia, lymphoma where the disease is active
- Significant anaemia that is associated with clinical symptoms, or secondary failure of another organ
- Thrombocytopaenia, or any other disorder associated with increased risk of bleeding
- Active tuberculosis
- Infectious hepatitis
- Any other highly contagious infection
- Any other condition that results in a person not being able to meet strength, mobility and functional requirements for the position

Category B

- Mild anaemia
- Thalassaemia if associated with anaemia or other secondary condition
- Malignancies of the blood and lymphatic systems following treatment, providing that there is no abnormality in the full blood count (due to either treatment or the disease process)
- Chronic fatigue syndrome
- Splenomegaly such as following glandular fever
- Infection with blood born viruses including HIV and hepatitis C infection

HIV or hepatitis C infection per se are not contraindications for firefighting. However, the medical complications of these infections may result in illnesses that affects physical capacity fitness for firefighting.

ENDOCRINE CONDITIONS AND OTHER SYSTEMIC DISEASES

Category A

- Diabetes mellitus associated with:
 - (a) A history of disabling hypoglycaemia (low blood sugar) such as loss of consciousness
 - (b) Where the person has a poor awareness of the symptoms of impending hypoglycaemia
 - (c) Where there is evidence of any diabetes-related disease of other organs including eyes, kidney, heart, vascular system or neurological system
- Rheumatoid arthritis where there is evidence of significant involvement of hands, wrists or a weight bearing joint

Category B

- Diabetes mellitus of any type without the features mentioned above
- Connective tissue diseases such as systemic lupus erythematosus or rheumatoid arthritis where the disease is of mild form and not likely to be aggravated with heavy manual handling
- Documented evidence of a predisposition to heat stress
- Disorders of thyroid, adrenal gland or pituitary gland

PSYCHIATRIC CONDITIONS

Category A

- Any psychiatric condition associated with organic brain dysfunction
- Schizophrenia with psychotic episodes in spite of treatment
- Any other psychiatric condition with psychotic episodes in spite of treatment.
- Any psychiatric or psychological condition that prevents a person from being able to perform the essential duties of a firefighter.

Category B

- Psychiatric condition associated with substance abuse
- Prior history of post traumatic stress disorder
- Prior history of major depression, bipolar disorder, personality disorder or other serious psychiatric illness.

DRUGS, ALCOHOL AND PRESCRIBED MEDICATIONS

Category A

- Blood alcohol level of 0.02 or above (a requirement for heavy vehicle driving)
- The presence of any illegal drugs as identified on urine drug screen
- The presence of any prescribed medication at a level likely to cause psychomotor impairment
- Use of illegal drugs such as cocaine, marijuana, amphetamines or heroin
- Use of prescribed drugs as listed in category B below, where the pattern of use indicates drug dependent behaviour

Category B

- The regular use of alcohol or drugs, whether prescribed or not, that may affect the safe performance of operational duties. Examples of drug categories included:
 - sedatives, hypnotics, tranquilizers and sedating anti-histamines
 - narcotic analgesics
 - antipsychotics and antidepressants with sedating effects
 - skeletal muscle relaxants
 - drugs in other classes that may result in dizziness, problems with vision or cognitive or psychomotor impairment.

PREGNANCY AND WOMEN'S HEALTH CONDITIONS

Category A

- Pregnancy for its duration and for 6 weeks post-partum
- Complicated pregnancy such as that requiring caesarean section will require additional recovery time as recommended by the treating obstetrician
- Cancers of the breast and most gynaecological cancers during treatment
- Serious gynaecological conditions requiring major surgery until treated
- Any other women's health condition that results in the woman not being able to meet the strength, mobility and functional requirements for the position

Category B

- Menorrhagia
- Current mastitis or other complications associated with breast feeding
- Malignant tumours following treatment