



Breathing Apparatus

Medical Examination Information Booklet

(2008)



THE NEW SOUTH WALES GOVERNMENT

Breathing Apparatus (BA) Medical Information and Assessment Forms for Physicians

This booklet contains the following information and forms to ensure the adequate examination and sign-off of NSW RFS personal seeking to undertake Compressed Air Breathing Apparatus training

1. Background information on the use of Breathing Apparatus and the potential workload required of fire fighters
2. Instructions for the use of the Breathing Apparatus medical examination form
3. Information for examination of RFS fire fighters undertaking duties using Breathing Apparatus
4. Breathing Apparatus medical examination form (Form D)
5. Medical Examination results slip (Form D.1)

Background

Breathing apparatus (BA) enables rural volunteer firefighters to carry out firefighting inside structures and in other environments where respiratory hazards might exist. The BA Medical is designed to filter out firefighters who may be unsuitable for such tasks due to significant medical conditions or high risk factors. It was designed through consultation with the Cumberland College of Occupational Health.

Firefighters using BA will typically be asked to carry out firefighting while wearing protective clothing and equipment weighing up to 21 Kg, for periods typically of about 30 minutes, while encountering the following environmental conditions and physiological responses:

1. High levels of both radiant and convective heat, exacerbated with high levels of humidity once firefighting has started. The clothing worn by firefighters is primarily designed to protect firefighters from external heat. In doing so, however, it may prevent a loss of metabolic heat produced by the intense physical activity of firefighting. The firefighter is likely to have raised body temperatures particularly during prolonged exposures to heavy periods of work.
2. Moderate to high levels of work will be required while fighting a structural or similar fire. This work may have to be performed in stooped, cramped or crawling positions. Firefighters may have to walk on uneven surfaces while moving people out of buildings.
3. During a structural fire, firefighters may be exposed to high levels of psychological stress where inappropriate action may affect the lives of others. They will also have to operate under time constraints which will add to stress levels.

Instructions for use of the BA Medical Examination Form

The medical; examination form (Form D) included in this booklet should be supplied to you by the firefighter, or by local RFS Operations Officer, for recording the examination. The form should be completed during the examination and, except for the tear-off sections, should be retained by the examining physician for future reference. If a medical practice has an existing recording system that can achieve the same effect, it may be used. Completed forms/records from previous examinations should be forwarded to a firefighter's new examining physician if requested.

Two 'tear-off' slips are provided in the booklet (Form D.1). One is for the firefighter to retain as his/her personal record of the general result of the examination. The other is for their local District Operations Officer and acts as their official notification of the general result of the examination. It may be supplied to the local District Operations Officer directly, or via the firefighter, according to local preference/arrangements.

Note:

This BA medical examination was developed by the Cumberland College of Occupational Health for the specific needs of BA equipped firefighters in the NSW Rural Fire Service. Enquiries regarding its content should be initially directed to the Manager, Occupational Health, Safety and Welfare on 02 8741 5555.

Information for examination of RFS fire fighters undertaking duties using breathing apparatus

Cardiovascular Variables

Cardiovascular risks are the most significant for firefighters. Statistics indicate that about half of on-duty firefighter deaths are from heart attacks, mostly during firefighting activities. The risk becomes significantly greater once firefighters approach and exceed 50 years of age. There is also a smaller peak of risk within a couple of years of first commencing firefighting duties using BA.

Due to the nature of the demands placed on the cardiovascular system, if there is any doubt as to the suitability of a firefighter to meet these demands, it is suggested that the firefighter undergo a formalised stress test. If the firefighter presents with significant relative contraindications it is also advisable that a stress test be arranged. A minimal output of 45 ml.kg⁻¹.min⁻¹ is suggested. Failure to meet this standard excludes the firefighter from structural firefighting, or similar, using BA. However, with conditioning, he/she may meet the required standard at a later date.

It should be noted that high levels of obesity may suggest reduced fitness and capacity to work. Waist and hip measures (circumference) are situated level with the umbilicus and the greater trochanter, respectively. This score correlates well with risk factors associated with coronary heart disease.

Absolute Contraindications

- Known IHD
- Resting blood pressure > Systolic 160 mmHg, Diastolic 100 mm Hg
- Valvular heart disease
- History of myocardial infarction
- Angina pectoris
- Other active heart disease

Relative Contraindications

- Surgically corrected IHD (e.g. CABG) with normal work capacity
- Waist to hip ratio: Females > 0.8, Males > 0.9
- Body mass index (BMI) 28
- Family history of CHD
- > 40 years of age
- Symptoms of chest pain
- Resting ECG abnormalities
- Resting blood pressure > Systolic 140 mmHg, Diastolic 90 mm Hg.

Respiratory Variables

BA can considerably increase the demand associated with breathing. Failure to cope with using BA may endanger the firefighter, fellow firefighters and victims of a fire. Asthmatics and exercise induced asthmatics should not be passed to wear BA due to the likely consequences of an attack.

Any individual not meeting the physician's satisfaction should be referred for a chest X-ray and/or to a specialist for further spirometry and provocative testing.

Absolute Contraindications

- Active respiratory disease
- Chronic airway obstruction
- Asthma and exercise induced asthma
- Emphysema

Relative Contraindications

- FVC and FEV1 outside normative range
- FEV1/FVC, 80% outside normative range for age
- History of airways disease

Neurological Variables

Any neurological disorder that may prevent the satisfactory ability of the firefighter to perform tasks and exercise should exclude them from firefighting using BA.

Absolute Contraindications

- History of epilepsy or seizure
- CNS abnormalities likely to affect individual safety (e.g. muscle weakness or sensory impairment)
- Fainting, loss of consciousness or lack of coordination
- Parkinson's disease

Relative Contraindications

- Headaches, frequent and severe
- History of head injury
- Peripheral neuropathy

Hearing

Firefighters may have to rely totally on sound and feel to navigate in a structural fire in darkness or heavy smoke. Hearing is very important for understanding instructions over a high level of background sound. If the medical practitioner is concerned about the level of hearing in a firefighter, they should be recommended to a specialist for more comprehensive testing.

Relative Contraindications

- Unable to hear a forced whisper at 6m in both ears
- Failure of otoscopic examination

Vision

Sight is extremely important in firefighting. Firefighters will be required to read dials and identify colour coded containers. In structural fires firefighters may have obscured vision due to smoke contamination and should have satisfactory fields of vision. If a firefighter fails any aspect of the vision test it is suggested they should be recommended for specialist assessment.

Relative Contraindications

- Contact lenses
- A congenital abnormality or pathological condition which is likely to interfere with the proper function of, or jeopardise the efficient performance of, his/her duties
- Failure to achieve 6/6 vision unaided vision for each eye
- History of night blindness
- Failure of the Ishihara colour test.

Endocrinological Variables

Absolute Contraindications

- Insulin dependent diabetes

Relative Contraindications

- Non-insulin dependent diabetes requiring medication
- Non-insulin dependent diabetes on diet alone
- Other endocrine diseases

Renal

Absolute Contraindications

- Renal failure

Relative Contraindications

- Renal disease

Haematological

Absolute Contraindications

- Active leukaemia or other haematological disease (e.g. lymphoma)
- Any disease process causing anaemia
- Polycythemia

Relative Contraindications

- Haematological disorders
- Sickle cell disease
- Hb < 130 male
- Hb < 119 female

Gastrointestinal

The physician should assess the firefighter's likely risk of acute occurrences that may lead to disability or life threatening symptoms under levels of moderate to high work rates.

Absolute Contraindications

- Any active gastrointestinal or hepato-biliary disorder
- Painful hernia

Relative Contraindications

- Abdominal hernia
- Peptic ulcer
- Colitis
- Active diverticular disease
- Hepatitis, pancreatitis

Orthopedic

The firefighter will be carrying up to 21 Kg of additional weight and possibly assist, drag or carry people out of buildings. The ability of the firefighter to maintain a reasonable level of agility with this weight is of paramount importance.

BA masks seal around the face; across the forehead, temples, lower jaw and chin. Facial hair and/or unusual facial features or deformations can prevent an effective seal and allow carbon monoxide and other toxic gases to enter the mask during structural firefighting. A mask seal test can be arranged by the firefighter's local District Operations Officer if in doubt.

Absolute Contraindications

- Any condition limiting normal range of motion, strength and coordination.

Relative Contraindications

- Acute back pain
- Minor strength deficiency
- Facial characteristics that could prevent proper mask sealing

Behavioural

An ability to cope and approach stressful situations rationally is important for the successful performance of an individual while fighting a structure fire, or similar activities. If there are any doubts as to the firefighter's ability to cope with such activities using BA, the firefighter should be referred to a specialist and/or the relevant local fire training officer should be requested to observe the firefighter closely in fire simulations.

Absolute Contraindications

- Inappropriate motivations (proves ones self, etc.)
- Claustrophobis, agoraphobia, pyromania
- Any current or past incidence of psychosis
- History of panic disorder
- Serious drug or alcohol abuse or dependence

Relative Contraindications

- History of previous psychological disorders needing treatment

NSW Rural Fire Service

Breathing Apparatus (BA) Medical Examination Form

Instructions for the use of this form

The form consists of four pages, plus a single page containing the 'tear-off' results slips.

This form should be completed during the examination by the physician. The main section should be retained by the physician for reference during future examinations, but should be supplied to a firefighter's new physician if requested. The physician may use an alternative system (e.g. a system already in use in the medical practice) to achieve the same effect if desired.

The 'tear-off' results slips should be completed at the end the examination. One copy of the slip should be supplied to the firefighter for their personal records. The other copy should be supplied to the firefighter's local RFS District Operations Officer, as evidence of the results of the examination. The latter may be supplied either directly or via the firefighter being examined, according to local procedures/arrangements.

Personal Details

Surname: _____ First Name: _____

Address: _____ Postcode: _____

Sex (M/F): _____ Year of Birth: _____ Age: _____

History

Allergies: _____

Cigarette/tobacco use: _____

Alcohol consumption (grams per week) _____

Current medications: _____

Illness: _____

Risk factors for IHD: _____

Hypertension: _____ Cholesterol: _____

Physical activity: _____

Immediate family history of IHD, respiratory disease, neurological disorders:

History of night blindness: _____

ENT

Tinnitus: _____ Vertigo/dizziness: _____ Ear/discharge: _____

EYES

Glasses/contacts: _____

Visual field defects: _____

Other Disease (relevant to listed contraindications)

Operations/Injuries

General

Weight (kg): _____ Height (m): _____ BMI: _____

Waist (girth): _____ Hip (girth): _____ Waist/hip ratio: _____

Cardiovascular

Pulse rate: _____ Blood pressure: _____ Heart sounds: _____

Peripheral pulses: _____ Oedema: _____

Resting ECG: _____ Exercise ECG (optional): _____

Respiratory System

Spirometry: _____ FVC (l/min): _____ FEV1/FVC% _____

_____ FEV1 (l/min) _____

Trachea: _____ Lung fields: _____

Chest X-ray (optional): _____

Gastro-Intestinal Tract

Mouth: _____

Abdomen: _____ Organomegaly: _____

_____ Masses: _____

_____ Tendinous: _____

_____ Hernia: _____

Endocrine

Thyroid: _____

Urinary: _____ Albumin: _____ Sugar: _____ Blood; _____

Neurological

CNS: _____ Higher centres: _____

	Lower limbs		Upper limbs	
	Left	Right	Left	Right
Peripheral motor				
Sensation				
Reflexes				

Eyes: _____

Cranial nerves: _____

Vision

Acuity: _____

Ears / Hearing

Otoscopic examination: _____

Pure tone audiogram (if applicable): _____

Tympanometer (if applicable): _____

Musculo-skeletal

Full spine: _____ Cervical: _____ Thoracic: _____ Lumbar: _____

	Appearance	Joint mobility	Muscle tone	Strength
Upper limbs				

Lower limbs _____

BA face mask fit test needed (e.g. for unusual facial structure)? Yes No (tick)

Psychological Disorders

Potential (when firefighting using BA) ? _____

Physician's Questionnaire

(tick boxes where appropriate)

1. Is there any condition not listed in this examination which makes the individual unfit to use BA for structural firefighting or similar activities?

Yes No Remarks: _____

2. Do you recommend this individual as being suitable for using BA when fighting structural fires or similar activities?

Yes No Remarks: _____

3. Recommendation for medical re-examination

Standard - i.e. once initially, then every two years after 45 years of age

Every 2 years, regardless of age Every year, regardless of age

As specified: _____

Remarks: _____

4. Are there any further specialist investigations required for this individual?

Yes No Remarks: _____

Physician's Name; _____ (print) _____ (signature)

Place of Examination: _____ Date: _____

NSW Rural Fire Service (RFS)

Breathing Apparatus (BA) Medical Examination Tear-off Result Slip

(Local RFS District Copy)

The firefighter, _____ (name) was examined on _____ (date)
 at (location): _____

In my opinion this firefighter is (*tick one box only*):

- Fit to use BA for structural firefighting and similar activities
- Not fit to use BA for structural firefighting and similar activities
- Fit to use BA for structural firefighting and similar activities,
 but only under the following conditions:

Re-examination is recommended prior to (date): _____

Note: *Unless specified otherwise by the physician, re-examination is required initially (i.e. before becoming a BA trained operator for the first time) and then every two years after 45 years of age has been reached.*

Physician's Name; _____ (print) _____ (signature)

----- Cut, or fold and tear, along here -----

NSW Rural Fire Service (RFS)

Breathing Apparatus (BA) Medical Examination Tear-off Result Slip

(Firefighters Copy)

The firefighter, _____ (name) was examined on _____ (date)
 at (location): _____

In my opinion this firefighter is (*tick one box only*):

- Fit to use BA for structural firefighting and similar activities
- Not fit to use BA for structural firefighting and similar activities
- Fit to use BA for structural firefighting and similar activities,
 but only under the following conditions:

Re-examination is recommended prior to (date): _____

Note: *Unless specified otherwise by the physician, re-examination is required initially (i.e. before becoming a BA trained operator for the first time) and then every two years after 45 years of age has been reached.*

Physician's Name; _____ (print) _____ (signature)