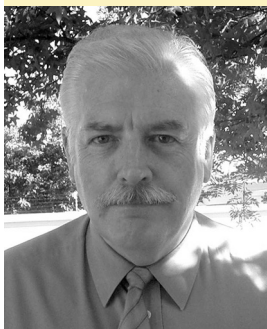


THE PRE-HOSPITAL TRAUMA AND EMERGENCY DOCTOR

Many doctors are poorly prepared to deal with pre-hospital trauma and emergencies, particularly those outside a practice centre or emergency clinic.



C MACFARLANE

BA (Hons), BSc (Hons), MB ChB, MSc, MMed (Surg), PhD, FRCS Ed, FRCS Eng, FACS, FCS (SA), FACEM (Hon), FFAEM, MRACMA, DMCC, FIFEM, FRAeS

Head

Netcare Foundation Chair of Emergency Medicine

University of the Witwatersrand
Johannesburg

Professor MacFarlane graduated from the University of St Andrews, Scotland. He trained as a surgeon in the Royal Army Medical Corps, serving worldwide, with active service in Oman and Northern Ireland. He was subsequently a medical director in the Middle East. He was a trauma surgeon at Johannesburg Hospital before becoming the Head of Emergency Medical Services training for the Gauteng Department of Health. He took up the Netcare Foundation Chair of Emergency Medicine at the University of the Witwatersrand in late 2003.

Professor MacFarlane's interests include pre-hospital care; aviation and diving medicine; disaster, conflict and humanitarian medicine; anti-terrorism; tropical medicine.

Many doctors have made efforts to improve response to pre-hospital emergencies, particularly trauma cases. These doctors are of considerable value to emergency medical services (EMS) on scene. In the United Kingdom this type of practice has been formalised. A society called BASICS (British Association for Immediate Care) recommends training, policies, operational procedures and equipment. The Faculty of Pre-Hospital Care of the Royal College of Surgeons of Edinburgh is also intimately involved. No equivalent structures exist in South Africa.

This article is designed to assist doctors, many of them young and enthusiastic, others mature and experienced, who would like to become involved in pre-hospital emergency care, particularly in trauma but also in other emergencies, such as cardiac emergencies, coma and collapse, etc.

BACKGROUND

EMS personnel are at basic, intermediate and advanced levels and it is important for pre-hospital doctors to understand the capability of their local EMS. Basic level EMS personnel can deliver basic life support, mainly simple airway management, splinting, and extrication. They can also defibrillate using automatic external defibrillators. Intermediate level staff can initiate intravenous (IV) therapy, defibrillate and give some drugs, e.g. glucose. Advanced level staff (true paramedics) can provide advanced airway management (including intubation, cricothyroidotomy), needle decompression of the chest and IV access, and can administer a variety of drugs, including morphine, anti-seizure drugs, overdose medication, and anti-asthma drugs. They are also proficient in ECG interpretation and the administration of drugs for cardiac dysrhythmias, and have other advanced skills.

EMS personnel are proud of their profession and are used to the pre-hospital environment and the necessary interaction with various on-scene agencies. Advanced paramedics routinely perform advanced airway management procedures in chaotic situations which most doctors would find daunting.

The attitude of EMS personnel to doctors on scene is variable. Many, especially the basic and intermediate level personnel, are grateful for the medical assistance, with its implicit advanced life support capability. Others are less thrilled, particularly at the advanced level, especially when a passing doctor stops at a scene, is inappropriately dressed for safety, has little idea of pre-hospital conditions, has no equipment and is rusty in advanced life support techniques. Under current HPCSA rules, when a doctor is present at a pre-hospital emergency, he or she automatically assumes medical control.

There is a definite place for doctors at on-scene incidents. In the case of advanced EMS personnel, the presence of a doctor can be reassuring. Many

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EMS personnel perform superbly and little medical input is necessary. In other cases, however, this is not so. Many advanced paramedics are protocol trained and, although technically excellent, do not have substantial pathophysiological or extensive medical education. Even those with tertiary level education do not have the broad education and experience of a current fully registered doctor. Some EMS personnel may forget that the pre-hospital activity is only one part of the patient's continuum of care and that pre-hospital management should be practised with the eventual outcome in mind. It is here that the doctor can be of particular assistance. The ideal is a mutually supportive effort between paramedic and doctor, each respecting the other, but this will only occur if the doctor is competent in advanced life support, pre-hospital orientated, properly equipped and with a collaborative attitude. The involvement of appropriately trained doctors in the running of ambulance services, as medical advisers and as EMS trainers, can only enhance future pre-hospital patient care, particularly now that formal emergency medicine training for doctors in South Africa is developing.

ESTABLISHMENT OF A MEDICAL PRACTITIONER PRE-HOSPITAL RESPONSE CAPABILITY

The decision by a doctor to become involved in pre-hospital response work cannot be taken lightly. Several considerations must be taken into account:

Liaison

It is vital that close liaison be maintained with whatever EMS exist in the proposed area of activity. Offers by a doctor to give medical advice, continuing education and training will usually be well received. Doctors may, in fact, if they fit in, be invited to be honorary, part-time or full-time members of a service. Getting to know members of the service, administrative as well as operational, is important.

Command and control

A system of callout must be developed, usually via the area control centre. The pre-hospital doctor must understand the on-scene command and control system of the service being supported.

Familiarisation with emergency services

It is necessary to understand the structures and function of all the agencies likely to be present at an incident, e.g. ambulance, fire, rescue, and police services and how they interact.

Communications

Two-way radio is necessary for on-scene and control room communication. If liaison is good this may be provided by the local emergency service. If it is purchased privately or by donation, it must be compatible with equipment and frequencies used by the emergency services.

Pagers are extremely useful, as can be cellphones, although these can be unreliable from time to time, especially in areas of poor reception or in cases of cell saturation during major incidents.

Training

The pre-hospital response doctor needs to be emergency trained to a high

level. Time in a busy emergency department, with exposure to major resuscitation, is essential. It is useful to have completed advanced trauma life support and advanced cardiac life support and paediatric advanced life support courses, as well as emergency medicine, disaster and major incident courses to be developed in South Africa.

The doctor must be proficient in radio procedure and navigation and must understand EMS terminology and rank structure. Familiarisation with the geographical area of operations is essential for rapid response. Defensive and advanced driving courses are recommended.

Vehicle

The response doctor may be provided with a vehicle by a local emergency service. If so, this will no doubt be an appropriate vehicle, suitably identifiable and equipped.

If the doctor decides to use his/her own vehicle, or a vehicle made available, it is important to remember that:

- The vehicle should be powerful enough to drive fast but not excessively so, as excessive speed can be dangerous and unproductive. It should be powerful enough to overtake rapidly and safely. ABS braking system is desirable in a response vehicle.
- A siren system can be installed easily and a flashing light can be mounted internally, or magnetically attached to the roof. Provincial EMS permission is normally required for flashing lights.
- The vehicle should be of a high-visibility colour and magnetic high-visibility stripes and markings can rapidly be attached to a 'normal' car. The car must be able to accommodate the recommended equipment without degradation of performance.
- The driver must be familiar with current light and siren policies and practices.

SAFETY EQUIPMENT

Personal protection

Protection from scene hazards is essential. Such hazards include adverse weather, poor lighting, vehicle wreckage, fire, chemical spill, body fluids, other emergency service vehicles, other traffic, and particularly careless drivers trying to see what is happening.

High-visibility jackets with reflective stripes are excellent and afford a degree of weather protection. In hot weather a light-weight reflective bib can be worn. Protective overalls are recommended. These can be reinforced and padded and can have useful pockets. These should also be high-visibility, preferably with reflective areas. All such clothing should have markings indicating that the wearer is a doctor.

Light-weight helmets are useful in certain circumstances. They can incorporate a visor, communications headset and, often very useful, a mounted flashlight for night use. Medical markings should be attached. Non-slip protective boots are advisable.

The selection of such clothing should be done in conjunction with local emergency services so that confusion does not occur.

From time to time other clothing may be necessary. This could include a heavy fire jacket, heavy boots, fire helmet, heavy duty gloves, chemical protection suits, and breathing apparatus. These items can usually be provided by collaborating emergency services but the use of some equipment requires appropriate training and courses.

Eye protection is essential, light-weight goggles being useful. Heavy latex gloves should be worn, with plenty of replacements. Ideally face masks should be worn but this is seldom practicable on scene. An important consideration in self-protection is anti-hepatitis inoculation and a workable protocol to deal with needle-stick injury.

Also important is adequate insurance cover and malpractice protection.

Identification

It is vital for on-scene doctors to carry approved identification, especially an HPCSA card. Paramedics are instructed to demand identification from doctors assisting on scene, as impostors are not unknown. This is also important when the doctor accompanies patients to emergency departments.

Medical equipment

When selecting medical equipment it is important that it is compatible with local ambulance services and emergency departments. An appropriate list follows:

Airway

- Oropharyngeal airways
- Endotracheal tubes and intubation equipment, adult and paediatric laryngeal mask airways and Combitube (pharyngotracheal lumen airway) are expensive but useful in the field.
- Cricothyroidotomy equipment
- Suction apparatus (battery operated and hand operated).

Ventilatory support

- Pocket mask resuscitator
- Bag valve mask, with paediatric capacity
- Oxygen — small cylinder is adequate, as ambulances are equipped
- Portable ventilator — only needed if advanced life support ambulance is not available and long transfer is necessary
- Oxygen masks
- Chest drains — bags for attachment plus Heimlich valve are helpful
- Nebuliser.

Circulatory support

- Intravenous cannulae (large bore included)
- Giving sets and tape
- Intravenous fluids — depends on local practice, controversial at present
- Ringer's solution, dextrose/saline is popular, hypertonic saline is being investigated

- Intraosseous needles for paediatric and, increasingly, adult use.

Monitoring devices

- Monitor/defibrillator, with pacing capacity — increasingly 12-lead ECGs are being used pre-hospital in cardiac cases
- Pulse oximeter.

Other equipment

- Sphygmomanometer
- Pupil torch
- Limb splints (including traction splint if the ambulance is not equipped)
- Cervical collars
- Exposure blankets
- Blood glucose strips and reagent
- Tape, gel, syringes, blood sample bottles, dressings, bandages, cord clamps
- Suturing kit plus forceps, clamps, scalpels
- Peak flow meter
- Scissors, seat belt cutter
- Fire extinguisher, torches, marker pens, hammer for car windows
- Report forms, triage cards, map books
- Stethoscope
- Pneumatic anti-shock garments, although extremely useful in certain circumstances (e.g. fractured pelvis plus femurs), are seldom used now and, if needed, are usually available on ambulances; in most cases it is not necessary for doctors to carry one.

Drugs

The choice can be variable and depends on local practice and the experience of the practitioner. Each doctor will have his/her own views on appropriate drugs. A suitable list might be:

- Analgesics, including morphine
- Cardiac arrhythmia drugs
- Rapid sequence induction drugs
- Frusemide
- Dextrose
- Sodium bicarbonate
- Hydrocortisone
- Anti-emetics
- Drug antagonists
- Anti-epileptic drugs
- Entonox

- Antipsychotic drugs for violent patients, e.g. haloperidol
- Bronchodilators.

Equipment should be carried in marked portable packs, already sorted out in logical packing system. Colour coding is useful for this. Some equipment can be carried in overall pockets, waist belt pouches or medical carrier vests. It is useful to carry some road cones and reflective tape for vehicle and scene protection and to have a light-weight bin for used disposables.

APPROACH TO SCENE, ASSESSMENT AND SAFETY

The trained and equipped pre-hospital doctor will proceed rapidly but safely to where he or she is required. If it is a road scene the doctor should park safely, utilising lights and cones as necessary and being directed by traffic officials when present. If the doctor arrives early, or first, the car should be parked in a fend-off position, to protect both casualties and rescuers. The engine should be kept running as lights and radio usage can rapidly drain power.

Safety is the next consideration. Note hazards such as fire, electricity, moving or collapsing vehicles, chemicals. These must be avoided, with guidance from emergency services. In the case of weaponry being used in an on-going fire fight, this should be contained before proceeding.

The doctor must immediately communicate with the other emergency services and identify him/herself.

Once scene safety is assured the circumstances of the event should be quickly reconstructed in order to predict possible injury. Working as part of a team, the doctor can then proceed to triage, patient assessment, emergency intervention as needed, patient management, assistance with extrication, patient evacuation. In this way the pre-hospital doctor can have a significant positive impact on patient management and subsequent emergency department activity.

In a home, factory or business incident, the doctor can play a crucial role in on-scene advanced life support, and assist in difficult patient evacuation and in the handling of relatives, colleagues and bystanders.

The pre-hospital doctor can play an important role in patient care but must be properly motivated, trained, equipped and familiar with the pre-hospital scene. He/she must be prepared to work collaboratively as a team member, utilising his/her advanced skills, knowledge and experience to the best advantage of the patient.

Further reading

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IN A NUTSHELL

Doctors practising in the pre-hospital emergency care area need to have training, equipment and dedication. Collaboration with emergency services is vital. Understanding of ambulance personnel capabilities, protocols and equipment is important.

The doctor must develop capacity and skills in command and control, communications, driving and navigation.

It is advisable to undergo additional advanced life support courses.

The provision, marking, equipping and driving of a response vehicle requires training and experience.

Personal protection clothing and equipment are vital.

Doctor identification documentation and marking are important.

Appropriate and compatible medical and other equipment must be carried.

Scene approach, assessment, safety and inter-agency co-operation and collaboration are fundamental.