

mouth-to-mouth breathing, is a pocket mask (can be bought at your local first-aid supplier).

If you feel you can help, park well away from the scene and walk to the accident

Hello

Once at the accident scene you need to establish the following:

- Are there people who are injured?
- How many people are injured?
- Are any people unconscious?
- Are any people trapped in the motor vehicles?
- Are there any other special hazards?

Help

Now, using the information mentioned above, call for help by phoning one of the following national emergency numbers — 10177 or 10111, or 112 on your cellphone, and

- identify yourself
- give a call-back number (in case you are cut off or they need more information later)
- give your precise location (the nearest cross street)
- say exactly what is wrong (e.g. motor vehicle accident, taxi and car, 12 people injured, 1 person trapped in the vehicle)
- answer any questions the call-taker may ask you
- try to create a picture in the call-taker's mind of what is actually happening on the scene — you are his/her eyes.

Once you have made the call send someone with a red rag to wave down arriving emergency services, because your exact location or the location of the accident may not be easily visible from the roadway. Now you can attend to the injured. A basic first-aid kit would be quite useful, so make sure you have one in the car. It need only contain the absolute basics, such as:

- wound dressings
- bandages
- latex gloves
- pocket mask

- triangular bandages or linen strips
- a few splints.

Now, faced with many injured people, you have to decide who to treat first, sorting according to a triage system. Unconscious people are the first priority because if they are lying on their backs they may choke and die. All unconscious persons should be turned on their side, taking care to keep the neck in line with the rest of the vertebral column. Once you have quickly run around and determined who the seriously injured are, you can begin to treat them first. In addition, when the emergency services arrive, you will be able to point out those who are the most seriously injured.

Now assess each patient's ABCs.

Airway

Is each person's airway open, is air able to pass through the mouth and nose and into the lungs? If the person is talking, his/her airway is open. Any noisy breathing means the airway is obstructed.

Unconscious people should be turned on their side; this will open the airway. If the person is sitting in the car with the head flexed forward, the airway is closed. Lift the head back until the eyes are looking forward and maintain this position until help arrives. This is best performed from behind the patient, i.e. from the back seat.

Breathing

Check for breathing. If there is no breathing use your pocket mask to give rescue breaths — 1 breath every 5 seconds.

Circulation

Check for bleeding. If there is bleeding, apply direct pressure with a dressing, towel or piece of material over the bleeding area and maintain the pressure. Don't remove the dressing bandage — keep it in place, ensuring that the bleeding has been controlled. Splint any fractures in the position of most comfort for the patient. Splinting a fracture reduces internal bleeding and pain.

Go from patient to patient, helping each in turn. It may be a while before emergency services reach you, especially if you are in a rural area. Once you have managed each patient, repeat the assessment process and re-evaluate each person. There may have been changes, e.g. bleeding may have started again, the person may have become unconscious. Re-evaluate your HHHABC protocol. Hazards may be worsening, you may need to call the emergency services again and you will definitely need to reassess the injured constantly.

Lastly, but most importantly, prevention of accidents is a priority. Make your environment safe and don't drink and drive, dive, swim, fly, walk or do any activity where you place yourself or others at risk.

No amount of alcohol is safe — don't drink and drive!

**EMERGENCY UNIT
EQUIPMENT — PROPER
PREPARATION IS
PARAMOUNT!**

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The Constitution of the Republic of South Africa states 'No one may be refused emergency medical treatment'. The South African Constitutional Court defines an emergency as 'a dramatic, sudden situation or event which is of a passing nature in terms of time'. Health facilities, whether private or public, are required to provide emergency treatment.¹

In an emergency the public, whether as patients, family members or friends, expect health care professionals to perform quickly and skilfully, using

Table 1. Suggested equipment for emergency units

Assessment and monitoring devices

Universal precautions <ul style="list-style-type: none"> • gloves • face mask • eye protection ECG monitor/defibrillator with <ul style="list-style-type: none"> • monitoring electrodes, gauze and razor blade • conductive paste (or defibrillation pads) 	<ul style="list-style-type: none"> • adult and paediatric paddles (or hands-free pads) • transcutaneous pacing • cardiac arrest board Blood pressure device with <ul style="list-style-type: none"> • large, normal adult, child and infant cuffs 	<ul style="list-style-type: none"> • stethoscope • Doppler monitoring Blood glucose testing equipment Thermometer <ul style="list-style-type: none"> • hyper- and hypothermic readings Pulse oximeter
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Airway and breathing devices

Oxygen delivery devices <ul style="list-style-type: none"> • rebreather masks • nasal cannulae • oxygen tubing Oxygen supply with flow regulator <ul style="list-style-type: none"> • portable or fixed unit Pocket mask with <ul style="list-style-type: none"> • 1-way valve, O₂ inlet and filter Bag-valve-device (self-inflating bag) with <ul style="list-style-type: none"> • O₂ reservoir • PEEP adaptor • adult, child, infant and neonatal masks Oropharyngeal airways <ul style="list-style-type: none"> • sizes 000 - 5 Nasopharyngeal airways <ul style="list-style-type: none"> • 14 - 30F Suction devices <ul style="list-style-type: none"> • bulb syringe • electrical or mechanical 	Suction catheters <ul style="list-style-type: none"> • tonsil tip (Yankauer) • flexible (6 - 14F) Laryngoscope handle <ul style="list-style-type: none"> • spare batteries and globes Laryngoscope blades <ul style="list-style-type: none"> • straight (no. 0 - 3) • curved (no. 2 - 4) Intubating stylets <ul style="list-style-type: none"> • 6 - 16F • articulating (Parker) Magill forceps <ul style="list-style-type: none"> • adult and paediatric Tracheal tubes <ul style="list-style-type: none"> • uncuffed (sizes 2.5 - 5.5 mm) • cuffed (sizes 3.0 - 8.0 mm) • water-soluble lubricant/KY jelly • syringe (10 ml) 	Oesophageal detector device <ul style="list-style-type: none"> • bulb version Exhaled CO ₂ detector <ul style="list-style-type: none"> • adult and paediatric Tube holders <ul style="list-style-type: none"> • adjustable (adult and paediatric) • tape and bite block Laryngeal mask airway <ul style="list-style-type: none"> • sizes 1 - 5 Needle cricothyrotomy <ul style="list-style-type: none"> • jet insufflation • retrograde intubation Tracheostomy tubes <ul style="list-style-type: none"> • sizes 00 - 6 Nasogastric tubes <ul style="list-style-type: none"> • 5 - 18F Chest tubes <ul style="list-style-type: none"> • 10 - 40F
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Circulatory access

IV cannulation <ul style="list-style-type: none"> • butterflys • catheter-over-needle cannulae (14 - 24G) • antiseptic wipes • rubber arm bands • securing tape • arm board • bandaging materials • sharps container Central vein access <ul style="list-style-type: none"> • 3 - 5F catheters 	Intraosseous needles <ul style="list-style-type: none"> • 15 - 18G Umbilical vein catheters <ul style="list-style-type: none"> • 3.5 - 5F • 5F feeding tube may be used Fluid administration sets <ul style="list-style-type: none"> • calibrated chamber (burette) • blood administration • high-flow set • 3-way stopcocks • IV fluid/blood warmer 	IV fluids <ul style="list-style-type: none"> • normal saline • modified Ringer's lactate • dextrose water • colloid Sample collection <ul style="list-style-type: none"> • needles and syringes (1 - 50 ml) • venous blood collection tubes • blood gas collection
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Table I. **Continued**

Drugs

(NB: Many drugs have multiple indications and emergency uses, but are listed below only once)

Cardiac arrest

- adrenaline
- amiodarone
- atropine
- bicarbonate
- calcium chloride
- dextrose
- lignocaine
- magnesium sulphate

Cardiovascular emergencies

- adenosine
- aspirin (soluble)
- clopidogrel
- digoxin
- diltiazem
- dobutamine
- dopamine
- esmolol
- furosemide
- isoprenaline
- morphine
- nitroglycerine (tablet/spray/IV)
- potassium

- sodium nitroprusside
- thrombolytic therapy
- verapamil

Respiratory emergencies

- aminophylline
- hydrocortisone
- ipratropium bromide
- promethazine
- salbutamol

Rapid sequence intubation

- etomidate
- ketamine
- midazolam
- propofol
- succinylcholine
- rocuronium
- vecuronium

Neuro-endocrine emergencies

- clonazepam
- clothiapine
- diazepam
- glucagon
- haloperidol
- insulin
- lorazepam

- mannitol
- phenobarbital
- phenytoin
- thiamine
- thiopentone

Poisoning antidotes

- activated charcoal
- antivenom (snake/spider/scorpion)
- acetylcysteine/carbocysteine
- biperiden
- desferrioxamine
- digibind
- dimercaprol
- flumazenil
- ipecac syrup
- naloxone
- obidoxime
- tripac-cyano (amyl nitrite, sodium nitrite, sodium thiosulfate)
- vitamin K

Paediatric dose chart

- Broselow colour-coded tape
- scale (infant and adult)

Equipment trays

Difficult/failed intubation

- see Table II

Vascular access

- venous cutdown
- central line cannulation
- catheter exchange set

Intercostal drain

- underwater seal drainage

Lumbar puncture

- spinal needles (20 - 25G)

Urinary catheterisation

- Foley catheters (5 - 18F)

Maternity pack

Newborn kit

- scalpel and cord clamps
- umbilical vessel cannulation
- meconium aspirator
- heating source/overhead warmer

Fixation devices

Spinal immobilisation

- cervical collars (adult and paediatric — adjustable)

- head blocks (adult and paediatric)
- spine boards (adult and paediatric)

- restraining devices (adult and paediatric)
- blankets and towel rolls

appropriate supporting equipment and techniques. Wherever health care professionals evaluate and treat patients, a legal duty to respond to life-threatening emergencies exists. Many life-threatening emergencies can be aborted if the signs of deterioration are recognised. Hodgetts *et al.*,² in a

review looking at the incidence, location and reasons for avoidable in-hospital cardiac arrest, found that '61.9% of arrests were potentially avoidable. 100% of potentially avoidable arrests were judged to have received inadequate prior treatment.'

For these reasons international training programmes such as the Advanced Cardiovascular Life Support (ACLS), Paediatric Advanced Life Support (PALS/APLS), Advanced Neonatal Life Support (ANLS/NRP), Advanced Trauma Life Support (ATLS), and the recently introduced Advanced Medical

Life Support (AMLS) are now being held almost every week throughout South Africa in an effort to raise the standard of practice of emergency care in this country. AMLS was inspired by research into the quality of care provided to patients before admission to intensive care.³ The management of airway, breathing, circulation, oxygen therapy and monitoring in severely ill patients was frequently found to be suboptimal, and the authors called for improved teaching and for the establishment of 'medical emergency teams', with the intention of responding to emergencies *before* the patient arrests, as opposed to 'cardiac arrest teams', which are

generally only deployed *after* the patient has arrested!

In addition to having the necessary knowledge and training, immediate availability and access to appropriate emergency equipment is inherent to providing proper emergency care. Tables I and II list suggested equipment and medications that responsible clinicians could obtain for their health care facilities. The lists are not intended to be all-inclusive, and the exact content and number of items will depend on the range and number of emergencies likely to be encountered in any specific setting. A further consideration would be the availability of

and proximity to additional equipment and more advanced facilities and specialised care.

The minimum standard of care should be the ability to manage respiratory and cardiac arrest in all age groups. No single other emergency demands more immediate attention or more precise management. Suggested emergency unit equipment, under the headings of 'Assessment and monitoring devices', as well as 'Circulatory access', 'Drugs', 'Equipment trays' and 'Fixation devices', which may be required for an impending arrest, is given in Table I. Few emergency situations are more frightening and fraught

Table II. **Equipment for a 'difficult intubation trolley'**

Device	Available sizes	Budgetary guide
Appropriate mandatory items		
Bag-valve mask + O ₂ reservoir + PEEP	Adult and paediatric	Standard
Suction apparatus	Range of catheters	Standard
Oropharyngeal airways	Range of sizes	Standard
Tracheal tubes	Range of sizes	Standard
Intubating stylets	Range of sizes	Standard
Magill forceps	Adult and paediatric	Standard
Laryngoscope set	Range of blades	Standard
Rebreather O ₂ masks	Adult and paediatric	Standard
Back-up devices		
Articulating stylet	Adult male and female	Cheap
Perilaryngeal airway	Range of sizes	Cheap
Streamlined liner of pharynx	Range of sizes	Cheap
Gum elastic bougie	Adult and paediatric	Fair
Hollow tube exchanger	Adult and paediatric	Fair
Laryngeal tube	Range of sizes	Fair
Cricothyrotomy set	Adult and paediatric	Fair
Laryngeal mask airway disposable	Range of sizes	Cheap
Laryngeal mask airway classic	Range of sizes	Fair
Laryngeal mask airway ProSeal	Range of sizes	Fair
Laryngeal mask airway FasTrach	Adult male and female	Expensive
Oesophageal-tracheal Combitube	Adult male and female	Expensive
Light wand stylet	Adult and paediatric	Expensive
Tru-View laryngoscope	Adult and paediatric	Expensive
Levering Laryngoscope	Adult	Expensive
Fibre-optic bronchoscope	Adult	Very expensive
Confirmatory and stabilising devices		
Oesophageal detector device	Bulb version	Cheap
Disposable CO ₂ detector	Adult and paediatric	Cheap
Tracheal tube holder	Adult and paediatric	Cheap
Cuff pressure gauge	Hand-held	Fair
Pulse oximeter	Hand-held	Expensive
Capnograph	Hand-held	Expensive

with medico-legal consequences than a difficult or failed intubation. Even in South Africa lawsuits, extending up to R100 million in damages, have been filed in recent months.⁴ Table II provides a list of proposed mandatory, back-up and confirmatory devices available, together with a budgetary guide, to aid emergency units in establishing formal 'difficult intubation trolleys'. Space will not allow for full descriptions, but details of these items

and available training can be obtained from www.resuscitationcouncil.co.za and www.advancedlifesupport.co.za, and from the 'Further reading' list. The presence of emergency equipment must of course always be linked to staff who are adequately trained in its proper use.

References available on request.

Further reading

American Heart Association. *Handbook of Emergency Cardiovascular Care for Healthcare Providers*. Dallas, Texas: American Heart Association, 2002. (Available from SAMA-HMPG. Price R110, members R99.)
 Kloeck WGJ, ed. *A Guide to the Management of Common Medical Emergencies in Adults*. 7th ed. Johannesburg: University of the Witwatersrand, 2004.
 Kloeck WGJ, ed. *CPR Alive — Special Algorithm Edition* (2004 update). Johannesburg: Resuscitation Council of Southern Africa, 2004.

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SINGLE SUTURE

WATER, SANITATION AND PET FOOD

It will take Africa 30 years to achieve the water target of the Millennium Development Goal, and it will never achieve the sanitation target, according to the UK charity, Wateraid. Wateraid cites examples of a 15% increase in Bangladeshi school attendance when water carrying time is reduced, and a 12% increase in school attendance in Tanzania when water is available within 15 minutes, rather than an hour or more away. Studies have also found that 11% more girls attend school when sanitation facilities with proper privacy are available. Halving the number of people without water by 2015 will take \$29 billion globally — less than Europe and North America spend on pet food every year.

Lancet 2004; **363**: 954.