

# Resuscitation preparedness for general practice

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## Abstract

General practices are not exempted from situations dealing with dire emergencies. For general practitioners to be effective in coping with such situations, they should at all times be prepared to resuscitate patients. This article gives an overview of the preparation required to manage such events.

### INTRODUCTION

Most of the time general practitioners deal with patients presenting with acute, short-term illness, much of it transient and self-limiting; chronic illness; and behavioural problems. Many patients present with problems that have a complex mixture of physical, psychological and social elements. Therefore, the general practitioner needs to develop skills in problem solving, preventive, therapeutic and resource management.

Sometimes, general practices are faced with seriously ill or injured patients who have to be managed until the arrival of an ambulance with advanced life support trained personnel. In these situations, the practitioner should be in a position to provide life saving procedures to save the patient from life threatening situations. Sick patients, or patients with minor problems, or even a patient coming for a routine check up, may suddenly develop a life threatening problem such as anaphylactic shock. Some of them might even develop a cardiac arrest or peri-arrest situation while consulting the doctor, while receiving a medication or while waiting in the waiting room. In life threatening emergencies, there is little time to make a diagnosis; instead, resuscitation needs to be started immediately following initial assessment.

### PREPARATION

The golden rule of resuscitation is to BE

PREPARED. Therefore, it is mandatory that general practices should have adequate basic facilities to be able to manage medical emergencies. Preparation to cope with resuscitation situations includes having proper equipment and medication in an easily accessible area. It is also extremely important for the practitioner to be knowledgeable and skilled in immediate life support techniques. The equipment and drug list provided in Table 1 can be used as a suggested checklist for a doctors' emergency bag ("Doctor's Backpack").

This list is only a start; additional items will be required depending on the proximity and rapid availability of backup and further professional support.

Have the emergency medical services (EMS) number prominently displayed in the practice. As soon as a life-threatening condition occurs, the receptionist/nurse in the practice should be able to call the EMS and assist the doctor with the resuscitation. Therefore it is important for the receptionist and nurses in the practice to be skilled in first aid and basic CPR as well.

Table 1 – Content of Doctor's Emergency Bag ("Backpack")

Airway & Breathing	Circulation & Drugs	Others
<ul style="list-style-type: none"> <li>• Pocket Face Mask</li> <li>• Venturi Mask</li> <li>• Oropharyngeal Airway</li> <li>• Suction, e.g. Manual</li> <li>• Bag-Valve-Mask ventilation device</li> <li>• Endo tracheal tubes</li> <li>• Laryngoscope</li> <li>• Cricothyrotomy set</li> <li>• Oxygen supply</li> <li>• Spacers/Nebulization set</li> <li>• Peak Flow Meter</li> <li>• Stethoscope</li> <li>• Pulse oxymeter</li> <li>• Needle with one-way valve</li> </ul>	<ul style="list-style-type: none"> <li>• Intravenous cannula</li> <li>• Fluid giving sets</li> <li>• Normal Saline and/or Ringer's Lactate bags</li> <li>• Needles &amp; Syringes</li> <li>• BP Apparatus</li> <li>• Umbilical Clamps</li> <li>• 50% Dextrose 50 ml and/or Glucose gel</li> <li>• Adrenaline 1:1000</li> <li>• Atropine</li> <li>• Salbutamol inhalers/nebulas</li> <li>• Diazepam</li> <li>• Aspirin</li> <li>• Glyceryltrinitrate(GTN) sublingual spray</li> <li>• Morphine</li> </ul>	<ul style="list-style-type: none"> <li>• Gloves, Masks and Goggles</li> <li>• Tourniquet</li> <li>• Glucometer</li> <li>• Pen torch</li> <li>• Antiseptics/Swaps</li> <li>• Scissors</li> <li>• Gauze &amp; Bandages</li> <li>• Plasters, Band-aids and steri-strips</li> <li>• Sterile suture packs and materials</li> <li>• Burn dressings</li> <li>• Eye pads</li> <li>• Sanitary pads</li> <li>• Cervical collar</li> <li>• Sharp disposal container</li> </ul>

## AIRWAY & BREATHING MANAGEMENT

The first step in resuscitation is to have a clear and patent airway. Opening the airway may be achieved by extending the neck by simultaneously tilting the forehead back with one hand and lifting the chin with the other hand. If the patient is unconscious but breathing, lie him/her on his/her side (the recovery position). However, if a neck or spinal injury is suspected, the airway should be opened using a jaw-thrust manoeuvre or chin lift without any head tilt, and maintain cervical spine stabilisation. Suctioning may be necessary to remove fluids from the mouth, nostril and throat. Suction the mouth and throat first and then the nostrils, with the patient preferably in the lateral position.

If the patient is spontaneously breathing, provide supplemental oxygen using a simple face mask, venturi mask or preferably a partial re-breather mask (depending on availability). Simple face masks can deliver up to 40-50% oxygen for a patient who is receiving 100% oxygen from the oxygen outlet, venturi masks deliver up to 50-60% oxygen and partial re-breathers 60-70% depending on the oxygen flow rate. A guide to the required flow rate when using a partial re-breather mask is to monitor its oxygen reservoir bag; if it collapses more than  $\frac{1}{3}$  with inspiration, the flow rate may not be adequate.

If an unconscious patient is to be resuscitated, the patient may require tracheal intubation as a definitive airway because the patient cannot maintain the patency of his/her airway. Some general practices may not have a laryngoscope and tracheal tubes. If this facility is not available, patients can still be safely and adequately ventilated until the arrival of EMS by using positioning and mask ventilation. In unconscious patients, an oropharyngeal airway could be used to keep the airway patent. The selection and method of insertion of the oropharyngeal airway is important. Incorrect use may result in airway obstruction. The Guedal oropharyngeal airway is commonly used; the length is selected by measuring against the side of the face from the angle of the mouth (at the incisor) to the angle of the jaw

(at the earlobe). A shorter airway may not hold the tongue up and a longer one might pass down the oesophagus or may even fold the epiglottis over the glottic opening. It is ideal to support the tongue with a wooden tongue depressor while inserting an oropharyngeal airway, ensuring that the tongue is not pushed down.

If a patient is not breathing or having inadequate breathing, the ventilation must be assisted with either mouth-to-mouth, mouth-to-mask or bag-valve-mask (BVM) ventilation. Mouth-to-mouth ventilation is not popular in this present day due to the fear of transmitting serious communicable disease. A cheap option could be to use a protective mouthpiece during rescue breathing. It would be preferable for practices to have a pocket face-mask and/or BVM ventilation device. The mask should be selected such that the size is just big enough to cover the nose and the mouth completely. A bigger or smaller mask may not provide a good seal, allowing air to leak. For an effective seal it is important for the mask to be held firmly on the face using both your hands. If a BVM device (also known as a self-inflating or "Ambu" bag) is available, an assistant could be asked to help ventilate the patient. It is far more effective to ventilate a patient using 2 rescuers than try to use a BVM device single-handed.

A BVM device can be used with or without supplemental oxygen. If oxygen is available, it is beneficial to attach an oxygen reservoir bag, which increases the oxygen concentration to the patient from about 50% to more than 90%. The delivered oxygen concentration will depend on the oxygen flow rate. A guide to the appropriate flow rate is to watch the reservoir bag, which should not collapse more than  $\frac{1}{3}$  during ventilations. If there is a pulse and the patient needs ventilations only, this should be done at a rate of 12/minute (every 5 seconds) for adults, 20/minute (every 3 seconds) for children and infants, and 30-60/minute for newly-borns.

If airway obstruction is suspected due to a foreign body, a finger sweep, backslap, abdominal thrust (Heimlich manoeuvre) or chest thrust manoeuvre could be used. A finger sweep together with a tongue-jaw lift could be

attempted on an unconscious victim. A blind finger sweep could be attempted on an adult patient suspected to have a foreign body obstruction, but this procedure must be done only if the object is visualised for children and infants. A backslap is often effective provided that the victim's face can be lowered below his/her chest. Once this position is achieved, a firm backslap is given with the heel of the hand between the shoulder blades onto the back of the chest. This could be done for any age group, but is ideal for small children and infants. Another manoeuvre is the abdominal thrust. This is contraindicated in infants and small children due to the possibility of injuring their large intra-abdominal organs. For a conscious victim, the abdominal thrust is done by standing behind the victim and placing your fist just above the umbilicus. Hold your fist with the other hand and give up to 5 quick and sudden upward and inward thrusts. This can be repeated as necessary until effective or until the patient becomes unconscious. For a patient who is unconscious and suspected to be choking, the abdominal thrust could be applied by straddling the patient's thighs and placing both hands, one on top of the other, just above the umbilicus and giving up to 5 quick and sudden upward and inward thrusts. Abdominal thrusts may not be possible for obviously pregnant women and obese patients. Here chest thrusts are done instead of abdominal thrusts. Chest thrusts are done at the same site as chest compression for cardiopulmonary resuscitation (CPR); on the lower half of the sternum, but using up to 5 quick sudden compressions. In infants and small children, both backslaps and chest thrusts are used alternately until effective. The infant is held along your forearm supporting the head with your hand. The rescuer should first kneel down, rest your forearm on your thigh. In this position, the infant will be placed with the face below the chest, and your forearm and thigh act as a firm support. In this position, backslaps can be applied between the infant's shoulder blades using the palm of your hand. If the foreign body is not removed after 5 backslaps, the infant should be turned face up onto your opposite forearm and

thigh. Up to 5 chest thrusts can be applied using two or three fingers positioned on the infant's sternum, just below an imaginary line drawn between the nipples. (*See Figure 1*).

If the above procedures fail to provide adequate ventilation and oxygenation, an emergency cricothyrotomy, either surgical or needle, should be attempted to save the life of the patient. If ventilation is not adequate due to tension pneumothorax, a needle thorocostomy (needle decompression of the chest) should be attempted. Needle thorocostomy is done by inserting a wide bore needle into the second intercostal space at the mid-clavicular line on the side of the pneumothorax.

## CIRCULATION MANAGEMENT

Once the patient's airway and breathing problems are corrected, together with protection of cervical spine if necessary, circulation should be assessed. This is done by feeling the carotid pulse in adults and children, and the brachial pulse in infants. At the same time, obvious external bleeding should be controlled, if present, with compression over the bleeding area and a pressure bandage. Later, if there is time to provide definitive treatment, the wounds could be closed after achieving haemostasis. If there is no pulse present, CPR should be started immediately. In newborn babies and infants, chest compressions should be started when the heart rate is less than 60/minute if there is no response to adequate ventilation.

Collapsed patients or patients with life-threatening emergencies may need either intravenous fluids and/or intravenous drugs. An intravenous line should be inserted as soon as airway and ventilatory problems have been assessed and corrected. Ringer's lactate or normal saline solutions could be used, but dextrose-containing fluids should be avoided in resuscitation situations where large volume infusions are required. The drip should run rapidly until the blood pressure rises in a hypovolaemic patient. Cardiac patients may not cope with large volumes of fluids; use a 60 dropper (60

drops/ml) giving set and maintain the intravenous line on standby. For trauma victims or patients in hypovolaemic shock, a high-flow giving set may be required.

## DRUGS

In most life-threatening situations, airway, breathing and circulatory assessment and resuscitation are initial priorities. In some situations drugs become necessary. The following drugs should be readily available:

- Adrenaline (Epinephrine) – 1 ml of 1:1000 intravenously for adult cardiac arrest patients, repeated every 3 minutes, and 0.01 ml/kg of 1:1000 for children in cardiac arrest. Use 0,25-0.5 ml of 1:1000 intramuscularly for anaphylactic shock.
- Glucose – for patients in hypoglycaemia. For patients in coma, glucose gel can be smeared around the buccal mucosa. Intravenous 50% dextrose can be used, if available, at a dose of 0,5g/kg.
- Aspirin – 100mg for patients with clinically suspected myocardial infarction.
- Nitroglycerin tablets/spray – for patients with suspected myocardial infarction or pulmonary oedema, with normal or elevated blood pressure.
- Normal saline or Ringer's lactate – 10 or 15 drops/ml giving set for volume depleted patients, and 60 drops/ml giving set for patients needing a line for standby.
- Oxygen – all patients with life-threatening conditions should receive supplemental oxygen.
- Nebulization – Beta-2 agonist nebulisers or inhalers (Salbutamol) – for patients with bronchospasm, especially due to bronchial asthma or allergic reactions.
- Antihistamine (e.g. promethazine) – for hypersensitivity reactions.
- Morphine – titrated doses of 1 to 3 mg intravenously for patients needing potent analgesics, especially due to myocardial infarction.
- Diazepam – intravenously or rectally for convulsions.
- Ergometrine – for postpartum bleeding.

- Atropine – 0,5-1mg IV for vagal-induced bradycardia.
- Hydrocortisone – 200mg IV for hypersensitivity reactions.

## CARDIOPULMONARY RESUSCITATION (CPR)

On a pulseless patient, provide 2 ventilations and 15 chest compressions for an adult patient; 1 ventilation and 5 chest compressions for children and infants, and 1 ventilation and 3 chest compressions for newly born babies. The lower half of the sternum should be compressed to the depth of 4-5 cm for adults, or 1/3<sup>rd</sup> of the child/infant's chest diameter, at a speed of approximately 100 compressions per minute (almost 2 compressions/second). In adults, compress on the sternum two fingerbreaths above the xiphisternum using two hands. In children, compress one or two fingerbreaths above the xiphisternum using one hand, and in infants and newly borns compress one fingerbreath below an imaginary inter-nipple line using two fingers, or preferably using two thumbs with the remaining fingers encircling the chest. If the adult patient's arrest was witnessed and found to be pulseless, a single precordial thump is recommended if a defibrillator is not readily available. This is given as a firm blow over the lower half of the sternum using a closed fist. The precordial thump is not recommended in unwitnessed cardiac arrest. (*See Figure 2*).

## CONCLUSION

General practitioners in South Africa have the opportunity to learn the above-mentioned life support techniques through short courses such as the Basic Life Support (BLS), Advanced Cardiovascular Life Support (ACLS), Advanced Trauma Life Support (ATLS) and Paediatric Advanced Life Support (PALS) courses. Successful completion of these courses is also accredited for Continuing Professional Development.

Information on these courses can be obtained from the Resuscitation Council of Southern Africa (Tel 011-478-3989) or at [www.resuscitationcouncil.co.za](http://www.resuscitationcouncil.co.za). □



Figure 1

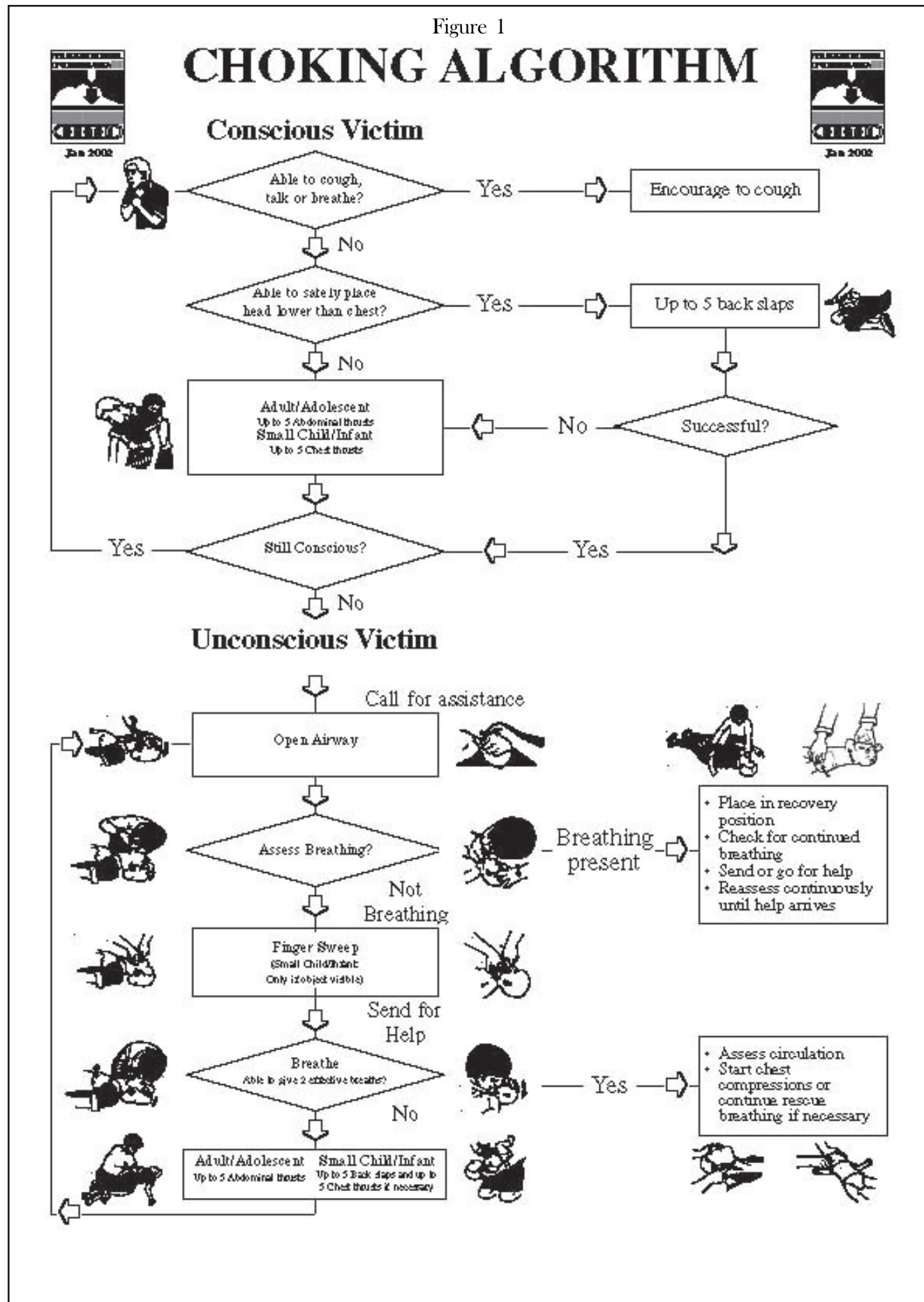
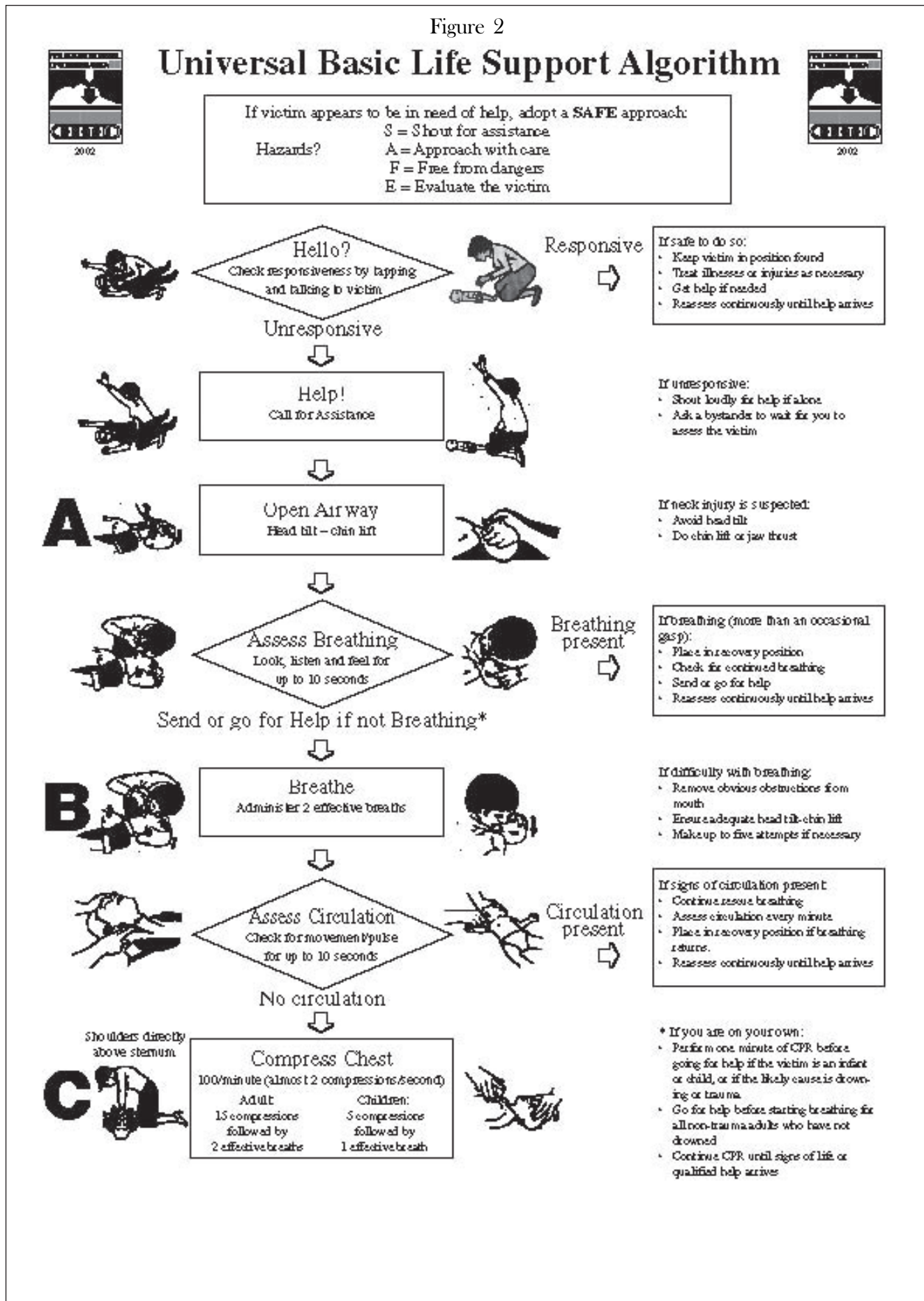


Figure 2



***Suggested further reading***

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