

Emergency Medicine and General Practice

Gunther Abela

Introduction

Emergency Medicine and Immediate Medical Care are relatively new specialties. In Malta, there is quite a considerable area of overlap between these specialties and general practice. Indeed, the family physician is confronted with some sort of medical emergency quite regularly.

The brief of this article is to go through recent developments in Emergency Medicine as applied to General Practice. The areas considered are Basic Life Support, Head Injury, Asthma, Anaphylaxis, Community Acquired Pneumonia, Burns and Controlled Hypotensive Resuscitation. Whenever possible, distinct practical guidelines will be suggested as an aid in the clinical management of emergency situations which the family physician may encounter.

This overview of new developments is by no means comprehensive but serves to highlight the increasing importance given to the role of the first-line medical practitioner in the emergency situation.

Basic Life Support and Automated External Defibrillators

The latest guidelines in Basic Life Support (BLS) of the European Resuscitation Council^{1,2} (ERC) are illustrated in Figure 1.

The algorithm is mostly self-explanatory. However the following points need to be considered in further detail:

1. In adult basic life support, if the rescuer is alone (without a defibrillator), a heart problem should be assumed as the cause of the cardiac arrest. The rescuer should thus go for help as soon as it has been established that the victim is not breathing. The rationale behind this guideline is that cardiac arrests due to a heart problem usually result from ventricular fibrillation (VF) or pulseless ventricular tachycardia (VT). The most effective treatment for this type of cardiac arrest is defibrillation: one has to get a defibrillator to the patient as early on as possible.

On the other hand, if the likely cause of unconsciousness is a breathing problem, then the rescuer should perform cardiopulmonary resuscitation (CPR) for about 1 minute before seeking help. Instances in which a breathing problem is assumed include trauma, drowning, drug or alcohol intoxication or if the patient is younger than 8 years of age. The only exception to this rule is if the patient is an infant or child with known heart disease and the collapse was sudden and not caused by trauma or poisoning.
2. The ratio of rescue breaths to chest compressions is *always the same* independent of whether there are one or two rescuers.
3. The landmarks for chest compressions are as follows:
 - Adult: middle of the lower half of the sternum (i.e. roughly two fingers' breadth from the point where the ribs join the sternum).
 - Child: same position as in adults, roughly one finger's breadth from the point where the ribs join the sternum.
 - Infant: one finger's breadth below an imaginary line joining the infant's nipples – one has to use the tips of two fingers instead of the bimanual approach.

Automated External Defibrillators (AEDs) have gained popularity recently and their use has been included in the ERC guidelines³, based on the fact that attempted early defibrillation is the single most important therapy for the treatment of VF/VT. Rapid decisions are essential as survival declines by about 7-10% for each minute after collapse.⁴ AEDs analyse the cardiac

Gunther Abela MD, MFAEM
 Mosta Health Centre, Primary Health Care Department
 A+E Department, St Luke's Hospital, Gwardamangia, Malta
 Email: gunson@maltanet.net

rhythm and, if indicated, prepare for shock delivery. Unused, the battery usually lasts five years and instructions are generally provided by synthesized voice messages, making them relatively easy to use as the operator does not have to recognize the cardiac rhythm. Defibrillation can in fact be provided by lay persons and public-access defibrillation programs have been established with AEDs being placed in key areas, readily accessible to the general public (e.g. train stations, airports etc.). The usual operational pattern of AED usage is that once cardiac arrest has been confirmed and help summoned, BLS is started until the adhesive electrodes are attached to the chest. One can then follow the voice prompts until help arrives.

Head Injury

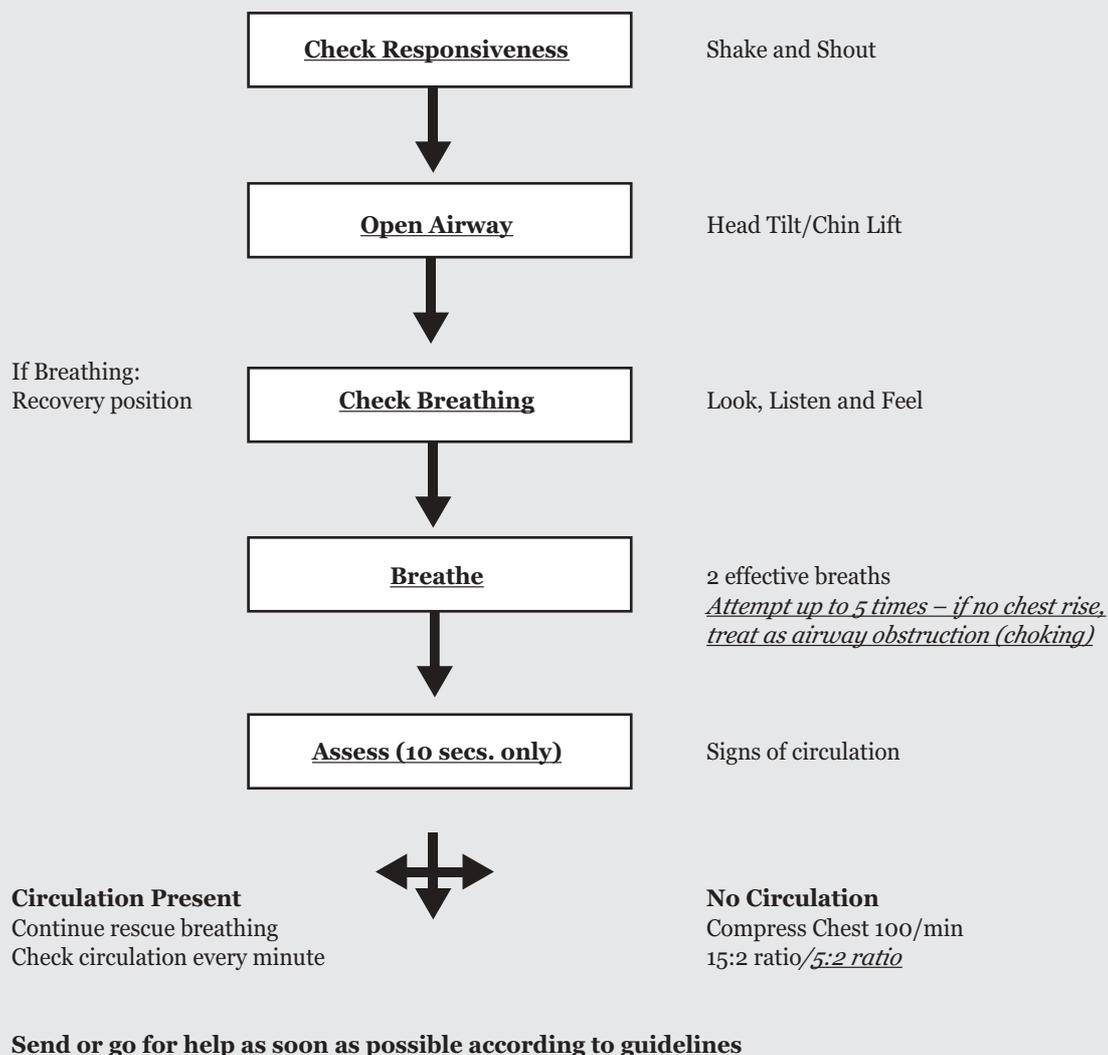
In June 2003, the National Institute for Clinical Excellence (NICE) of the U.K. issued a guideline on the triage, assessment, investigation and early management of head injury in infants,

children and adults. The importance of this document is that it defines computed tomography (CT), instead of conventional skull X-rays, as first line radiological investigation of choice, which advice is also found in American and Canadian guidelines. This has led to a good deal of controversy in the U.K. due to issues of costs and availability and the full text of the guidelines may be viewed in the NICE website www.nice.org.uk. Of particular interest to the family physician is Algorithm 2 of the guidelines (p. 245) dealing with referral of patients with a head injury by community medical services.

Asthma

The ERC has made a slight modification to the management protocol of acute severe / life threatening asthma.⁵ First line treatment remains the same i.e. high concentration oxygen and nebulized bronchodilators (B₂-agonists, alone or combined with anticholinergics). The second line drug was previously

Figure 1: Comparison of ERC Adult and Paediatric BLS Algorithms



(underlined text in italics outlines where paediatric BLS differs from adult BLS)

subcutaneous salbutamol or intravenous aminophylline. The preferred drug is now adrenaline (0.3mg or 0.3ml of 1:1000, administered subcutaneously). This has made the first line management simpler for the family physician since it obviates the need of carrying additional drugs. It is important to note here that intravenous hydrocortisone is not an essential initial drug since it takes about 4-6 hrs to reach full effect: a time gap which is crucial to a patient with life threatening asthma.

Anaphylaxis

The management of anaphylaxis has also been modified by the ERC and also endorsed by various bodies involved in emergency care, amongst them the Faculty of Pre-hospital Care of the Royal College of Surgeons of Edinburgh.⁶ The most important modification is in the dosage of intramuscular adrenaline, outlined in Table 1.

Securing the airway and giving high-flow oxygen are the initial steps in the management of anaphylaxis. As regards drugs, antihistamines (H₁-blockers) are the first-line drug of choice in mild and moderate anaphylaxis (e.g. if the reaction is moderately severe, chlorpheniramine 10-20mg delivered slowly intravenously is recommended). These medications should be continued for at least 24-48 hours to prevent relapse. The administration of an H₂-blocker (e.g. ranitidine) should also be considered. However if the anaphylaxis is severe with clinical signs of shock, airway swelling, or definite breathing difficulty, then intramuscular adrenaline is the first line drug of choice (rapidly followed by administration of an antihistamine). Patients receiving beta-blockers or anti-depressants require special consideration due to the possibility of augmentation of the effect of adrenaline. One must again reiterate that corticosteroids are considered as slow acting drugs and are thus not first-line drugs in anaphylaxis. They may have a role in preventing relapse and shortening protracted reactions.

The U.K. Resuscitation Council and the ERC⁵ caution that patients should be warned about the possibility of an early recurrence of symptoms and in some circumstances, they should be kept under observation for 8-24 hours. This particularly applies to:

- Severe reactions with slow onset due to idiopathic anaphylaxis.
- Reactions in severe asthmatics or with a severe asthmatic component.
- Reactions with the possibility of continuing absorption of the allergen.
- Patients with a previous history of biphasic reactions.

Community Acquired Pneumonia

The 'Guidelines for the Management of Community Acquired Pneumonia in Adults – 2004 Update' is available on the British Thoracic Society (BTS) website www.brit-thoracic.org/guidelines. Of particular interest to the family physician when faced with an acute case of community acquired pneumonia (CAP) is the severity assessment. This is of utmost

Table 1 Dosage Schedule of *i.m.* Epinephrine (Adrenaline) in Anaphylaxis (adapted from Manual of Core Material of RCS(Ed)⁶

Age	Volume of Adrenaline	Adrenaline
	1/1000	Dose
Under 6 months	0.05ml	50 microg
6months to 6 years	0.12ml	120 microg
6 to 12 years	0.25ml	250 microg
Adult and adolescent	0.50ml	500 microg

help when deciding whether to refer to hospital or not. The guidelines mention a 5-point score, one point for each of Confusion, Respiratory rate ≥ 30 /min, low systolic (< 90 mmHg) or diastolic (≤ 60 mmHG) Blood pressure, age ≥ 65 years (CRB-65 score). The recommendations are as follows:

- CRB-65 = 0: implies a low risk of death and patients do not normally require hospitalisation for clinical reasons.
- CRB-65 = 1 or 2: implies an increased risk of death and hospital referral and assessment should be considered, particularly with score 2.
- CRB-65 = 3 or more: implies a high risk of death and patients thus require urgent hospital admission.

The BTS 'Guidelines for the management of CAP in Childhood (2002)', which can be viewed on the same website, also give indications for severity assessment. Indications for admission to hospital in infants include:

- Oxygen saturation $\leq 92\%$ (pulse oximeter reading), cyanosis
- Respiratory rate > 70 /min
- Difficulty in breathing
- Intermittent apnoea, grunting
- Not feeding
- Family not able to provide appropriate observation or supervision

Indications for admission to hospital in older children:

- Oxygen saturation $\leq 92\%$, cyanosis
- Respiratory rate > 50 /min
- Difficulty in breathing
- Grunting
- Signs of dehydration
- Family not able to provide appropriate observation or supervision.

The management of a burns patient

The Faculty of Pre-hospital Care of the Royal College of Surgeon of Edinburgh has issued the guidelines 'Consensus on the prehospital approach to burns patient management' (2004).⁶ This document outlines the key steps in the initial management of burn patients in the prehospital environment.

These can be summarized as follows.

1. Ensure Safety (of self, scene and casualty)
2. Stop the burning process (the patient should also be removed from the burning source).
3. Check AcBCDE (Airway with cervical spine stabilization, Breathing, Circulation, Disability of the CNS, Exposure and Environment).
4. Cool the burn wound by running cool tap water for at least 10 minutes.
5. Dress the burn wound to help the patient's pain control and to keep the burnt area clean. The initial dressing of choice is a cellophane type wrap Clingfilm. In chemical burns, only wet dressings should be used.
6. Assess burn severity (e.g. Wallace rule of nines).
7. Cannulation (and fluids). Fluid replacement (i.e. Hartman's or 0.9% normal saline) should be considered when the burns surface area is greater than 10% in a child and 20% in an adult and/or if the time to hospital is more than one hour from time of injury.
8. Analgesia. This involves titrated opiate analgesia apart from cooling and covering the burned area.
9. Transport to the appropriate facility as fast as possible.

Fluid resuscitation in pre-hospital trauma

The issues related to fluid resuscitation in prehospital trauma care have been tackled by the Royal College of Surgeons of Edinburgh and a Consensus document has been issued (2002).⁷ The main problem that vexes the family physician confronted with a hypovolaemic trauma patient is the balance between administering fluids (and thus increasing the risk of re bleeding and delaying transfer) and withholding fluids (thereby possibly increasing the risk of organ ischaemia). Controlled hypotensive resuscitation or permissive hypotension is the fluid management system whereby the blood pressure is allowed to remain below the normal healthy levels, with the aim

of maintaining vital organ perfusion without exacerbating haemorrhage. The recommendation mentioned in the Consensus document can be summarized as follows:

- Cannulation procedures should not unnecessarily prolong the on-scene time, with only two attempts being recommended.
- Entrapped patients require cannulation on site.
- Normal saline is recommended as a suitable fluid for administration to trauma patients.
- Boluses of 250ml fluid may be titrated against the presence or absence of a radial pulse (i.e. systolic blood pressure of about 80-90 mmHg). It is important to note that:
 - In penetrating torso injury the presence of a central pulse (femoral or carotids) should be considered adequate.
 - In head injury patients, a higher pressure is required to maintain cerebral perfusion.
 - In infants, the use of a brachial pulse is more practical as it is easier to feel.

References

1. Handley AJ, Monsieurs K.G., Bossaert L.L. European Resuscitation Council Guidelines 2000 for Adult Basic Life Support. *Resuscitation* 48 (2001): 199-205.
2. Phillips B, Zideman D, Garcia-Castrillo, et al. European Resuscitation Council guidelines 2000 for Basic Paediatric Life Support. *Resuscitation* 48(2001): 223-229.
3. Monsieurs KG, Handley AJ, Bossaert LL. European Resuscitation Council Guidelines 2000 for Automated External Defibrillation. *Resuscitation* 48(2001) 207-209.
4. UK Resuscitation Council and European Resuscitation Council. *Advanced Life Support Provider Manual*. (2000): 63.
5. UK Resuscitation Council and European Resuscitation Council. *Advanced Life Support Provider Manual*. (2000): 113.
6. Faculty of Pre-Hospital Care of the Royal College of Surgeons of Edinburgh. *Manual of Core Material Issue 1 2003*. Section 15.1c11.
7. Allison K, Porter K. Consensus on the prehospital approach to burns patient management. *Emerg Med J* 2004; 21:112-114.
8. Revell M, Porter K, Greaves I. Fluid Resuscitation in prehospital trauma care: a consensus view. *Emerg Med J* 2002; 19:494-498.