ERC Guidelines for Resuscitation 2005 Summary

Main changes in adult basic life support

- The decision to start CPR is made if a victim is unresponsive and not breathing normally.
- Rescuers should be taught to place their hands on the centre of the chest, rather than to spend more time using the 'rib margin' method.
- Each rescue breath is given over 1 sec rather than 2 sec.
- The ratio of compressions to ventilations is 30:2 for all adult victims of cardiac arrest. This same ratio should also be used for children when attended by a lay rescuer.
- For an adult victim, the 2 initial rescue breaths are omitted, with 30 compressions being given immediately after cardiac arrest is established.

Main changes in automated external defibrillation

- Public access defibrillation (PAD) programmes are recommended for locations where the expected use of an AED for witnessed cardiac arrest exceeds once in two years.
- A single defibrillatory shock (at least 150J biphasic or 360J monophasic) is delivered, immediately followed by two minutes of uninterrupted CPR, without a check for termination of VF or a check for signs of life or a pulse.

Main changes in adult advanced life support

CPR before defibrillation

- In out-of-hospital cardiac arrest attended, but unwitnessed, by healthcare professionals equipped with manual defibrillators, give CPR for 2 min (i.e. about 5 cycles at 30:2) before defibrillation.
- Do not delay defibrillation if an out-of-hospital arrest is witnessed by a healthcare professional.
- Do not delay defibrillation for in-hospital cardiac arrest.

Defibrillation strategy

- Treat ventricular fibrillation/pulseless ventricular tachycardia (VF/VT) with a single shock, followed by immediate resumption of CPR (30 compressions to 2 ventilations). Do not reassess the rhythm or feel for a pulse. After 2 min of CPR, check the rhythm and give another shock (if indicated).
- The recommended initial energy for biphasic defibrillators is 150-200 J. Give second and subsequent shocks at 150-360 J.
- The recommended energy when using a monophasic defibrillator is 360 J for both the initial and subsequent shocks.

Fine VF

- If there is doubt about whether the rhythm is asystole or fine VF, do NOT attempt defibrillation; instead, continue chest compressions and ventilation.

Adrenaline (epinephrine)

- ***VF/VT***
  Give adrenaline 1 mg IV if VF/VT persists after a second shock.
  Repeat the adrenaline every 3-5 min thereafter if VF/VT persists.
- ***Pulseless electrical activity / asystole***
  Give adrenaline 1 mg IV as soon as intravenous access is obtained, and repeat every 3-5 min thereafter until return of spontaneous circulation (ROSC) is achieved.

Anti-arrhythmic drugs

- If VF/VT persists after three shocks, give amiodarone 300 mg by bolus injection. A further dose of 150 mg may be given for recurrent or refractory VF/VT, followed by an infusion of 900 mg over 24 h.
- If amiodarone is not available, lidocaine 1 mg kg^{-1} may be used as an alternative, but do not give lidocaine if amiodarone has already been given. Do not exceed a total dose of 3 mg kg^{-1} during the first hour.

Thrombolytic therapy for cardiac arrest

- Consider thrombolytic therapy when cardiac arrest is thought to be due to proven or suspected pulmonary embolus. Thrombolysis may be considered in adult cardiac arrest on a case by case basis following initial failure of standard resuscitation in patients in whom an acute thrombotic aetiology for the arrest is suspected. Ongoing CPR is not a contraindication to thrombolysis.
- Consider performing CPR for up to 60-90 min when thrombolytic agents have been given during CPR.

Post resuscitation care - therapeutic hypothermia

- Unconscious adult patients, with spontaneous circulation, after out-of-hospital VF cardiac arrest should be cooled to 32-34°C for 12-24 h.
- Mild hypothermia may also benefit unconscious adult patients, with spontaneous circulation, after out-of-hospital cardiac arrest from a non-shockable rhythm or after cardiac arrest in hospital.

Main changes in paediatric life support

Paediatric basic life support

- Lay rescuers or lone rescuers witnessing or attending paediatric cardiac arrest will use a ratio of 30 compressions to 2 ventilations. They will start with 5 rescue breaths and continue with the 30:2 ratio as taught in adult BLS.
- Two or more rescuers with a duty to respond will use the 15:2 ratio in a child up to the onset of puberty. It is inappropriate and unnecessary to establish the onset of puberty formally; if the rescuer believes the victim to be a child then they should use the paediatric guidelines.
- In an infant (less than 1 year) the compression technique remains the same: two-finger compression for single rescuers and two-thumb encircling technique for two or more rescuers. Above one year of age, there is no division between one- or two-hand technique. The one or two hands technique may be used according to rescuer preference.

- AED may be used in children above one year of age. Attenuators of the electrical output are recommended between 1 and 8 years of age.
- For foreign body airway obstruction relief, in an unconscious child or infant, attempt five rescue breaths and in the absence of response, proceed to chest compressions without further assessment of the circulation.

Paediatric advanced life support

- The Laryngeal Mask Airway is an acceptable initial airway device for providers experienced in its use. In hospital, a cuffed tracheal tube may be useful in certain circumstances, e.g. in cases of poor lung compliance, high airway resistance or large glottic air leak.The cuff inflation pressure should be monitored regularly and must remain below 20 cm H_2O .
- Hyperventilation is harmful during cardiac arrest. The ideal tidal volume should achieve modest chest wall rise.
- When using a manual defibrillator, a dose of 4 J kg^{-1} (biphasic or monophasic waveform) should be used for the first and subsequent shocks.

Asystole, pulseless electrical activity (PEA)

- Adrenaline IV or IO should be given at the dose of 10 mcg kg^{-1} and repeated every 3-5 min. If no vascular access is available and a tracheal tube is in-situ, adrenaline may be be given at the dose of 100 mcg kg^{-1} via this route until IV/IO access is obtained

Defibrillation strategy

- Ventricular fibrillation/pulseless ventricular tachycardia (VF/VT) should be treated with a single shock, followed by immediate resumption of CPR (15 compressions to 2 ventilations). Do not reassess the rhythm or feel for a pulse. After 2 min of CPR, check the rhythm and give another shock (if indicated).
- Give adrenaline 10 mcg kg^{-1} IV if VF/VT persists after a second shock.
- Repeat adrenaline every 3-5 min thereafter if VF/VT persists.

Temperature control

- After cardiac arrest, treat fever aggressively.
- A child who regains a spontaneous circulation but remains comatose after cardiac arrest may benefit from being cooled to a core temperature of 32-34°C for 12-24 h. After a period of mild hypothermia, the child should be rewarmed slowly at 0.25-0.5°C h^{-1}.

Resuscitation of the newborn

- Protect the newborn from heat loss. Premature babies should be covered with plastic wrapping on head and body (apart from the face), without drying the baby beforehand. The baby so covered should then be placed under radiant heat
- Ventilation: an initial inflation for 2-3 seconds must be given for the first few breaths to help lung expansion
- Trachal route for adrenaline is not recommended. If the tracheal route must be used, a dose of 100 mcg kg^{-1} must be used.
- Suctioning meconium from the baby's nose and mouth before delivery of the baby's chest (intrapartum suctioning) is not useful and no longer recommended.
- Standard resuscitation in delivery room should be made with 100% oxygen. However lower concentrations are acceptable.